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ABSTRACT

This model was developed to assist Oregon community colleges in making a planned response to the needs of business and industry for retraining/training of their employees. The model offers a streamlined process for making needs assessments in business and industry through sequential steps for converting needs data into instructional programs. The model consists of process steps that allow a college to create a program from needs to instructional format, then market it to business and industry. The model includes the following five major sections: (1) conduct background research, (2) identify agency involvement, (3) conduct an occupational analysis, (4) conduct an instructional analysis, and (5) market the instructional program. Each of these sections is broken into smaller units. The smaller units are depicted by flow charts, and operational steps are outlined for the user. Appendixes contain forms for conducting analyses, marketing, and creating flow charts; and transparency masters for explaining the model. (KC)

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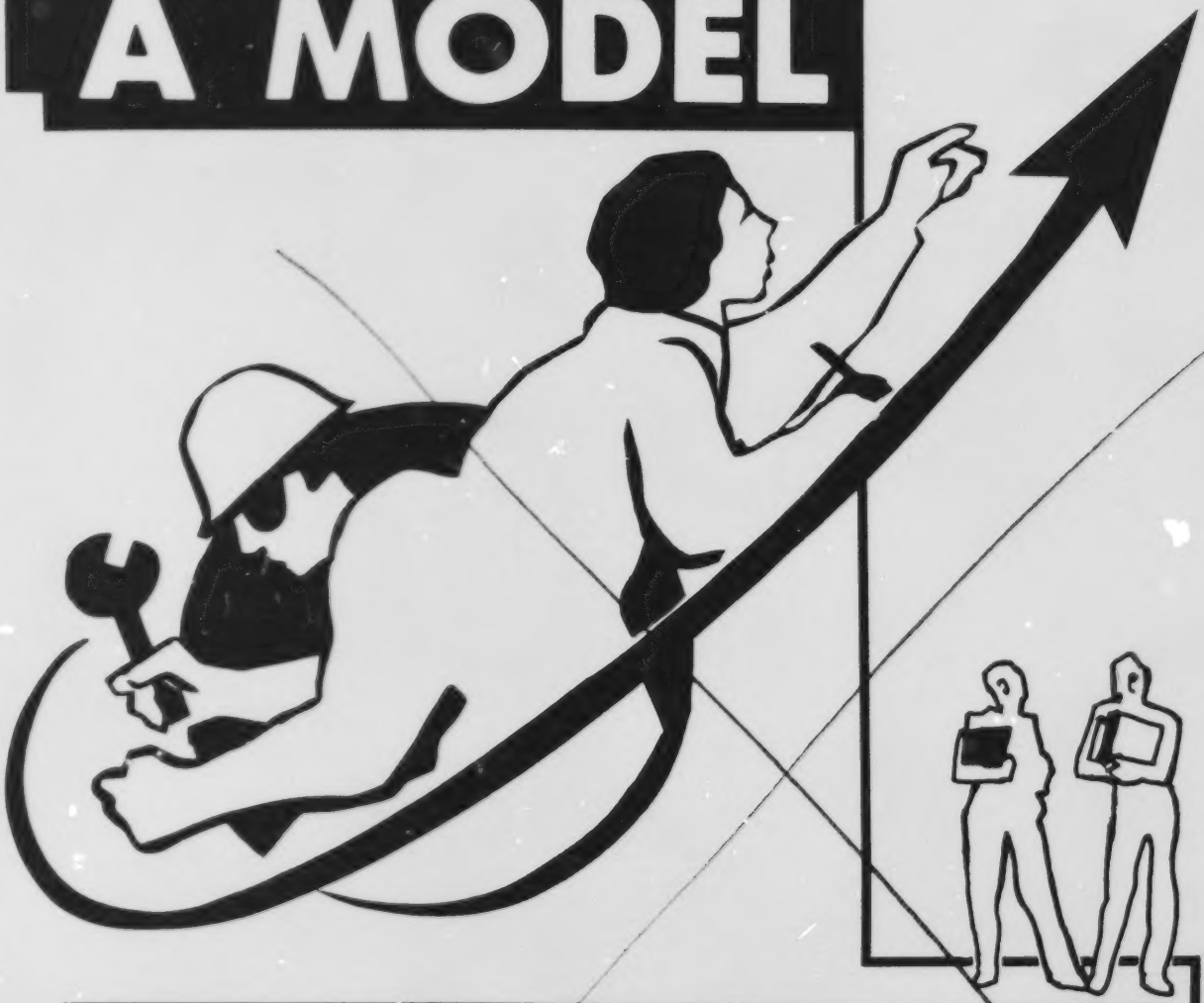
A MODEL



Retraining/Training

BUSINESS/INDUSTRY EMPLOYEES

Published by Clatsop Community College

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INTRODUCTION

Purpose

The purpose of this model is to assist Oregon Community Colleges in making a planned response to the needs of business and industry for retraining/training of their employees. The model offers a streamlined process for making needs assessments in business and industry and offers sequential steps for converting needs data into instructional programs. Steps in marketing of training proposals to business and industry have been defined by the Institute for Community Assistance at Portland Community College.

Users of the model processes will minimize the time required to implement retraining/training programs by eliminating waste effort. All steps of the model are not needed for development of short term retraining of business and industry employees. In those cases, a task inventory checklist can be used with an individual employer to identify retraining needs. After retraining needs are assessed, the program planner can use other steps in the model as appropriate.

The full model should prove beneficial for community colleges in planning new training programs and for upgrading existing ones. In planning one and two year training programs, the full process model should be utilized.

Suggestions for Planning and Staffing Implementation of the Model

The model was designed to allow its use by vocational instructors. Effective implementation of the model will require that at least one staff member in each community college be fully inserviced on the process of the model. With an understanding of and commitment to the approaches suggested by the model, this staff member can advise local

instructors on problems encountered during implementation. Although the model offers simplistic processes, an on-site troubleshooter can clear up confusion as it occurs and avoid failure in its implementation.

A catalyst type person is needed to establish the model processes in a community college setting. Some instructors are not familiar with the task inventory process, although it has been a basic precept for vocational education. The task inventory process will be more effectively utilized if instructors believe it to be worthwhile. An individual who can work with instructors and other staff and show them that task inventory is a worthwhile process for conducting assessments of retraining/training needs is recommended.

Management Implications

This model, like other products and processes, is most effective when it is supported by community college administrators. With administrative support, the process will not only be successful when utilized by the self-directed, highly motivated instructor but others as well. When administrative committment becomes apparent, staff will be encouraged to implement the model on an institution wide basis.

If a community college chooses to adopt the model, inservice training of a cadre on its proper use should be considered. This will allow staff to become more confident in their abilities to perform all the steps in the model. This cadre can then train other staff at the institution.

LIST OF ACRONYMS

CETA - Comprehensive Employment and Training Act

CIS - Career Information System

DOT - Dictionary of Occupational Titles

ECC - Educational Coordinating Commission

LIRS - Library Information Retrieval System

LMI - Labor Market Information

ODE - Oregon Department of Education

OES - Oregon Employment Statistics

OOICC - Oregon Occupational Information Coordinating Committee

OPPS - Occupational Program Planning System

OSU - Oregon State University

SEARCH - Systems Exploration and Research for Career Help

SIC - Standard Industrial Code

THE MODEL

The model for retraining/training of business/industry employees is directed at the development of process steps that will allow educational agencies to respond to an instructional need in a quick and effective manner. By clarifying the process steps and eliminating unneeded fumbling, a program can be converted from needs to instructional format and marketed in an organized fashion.

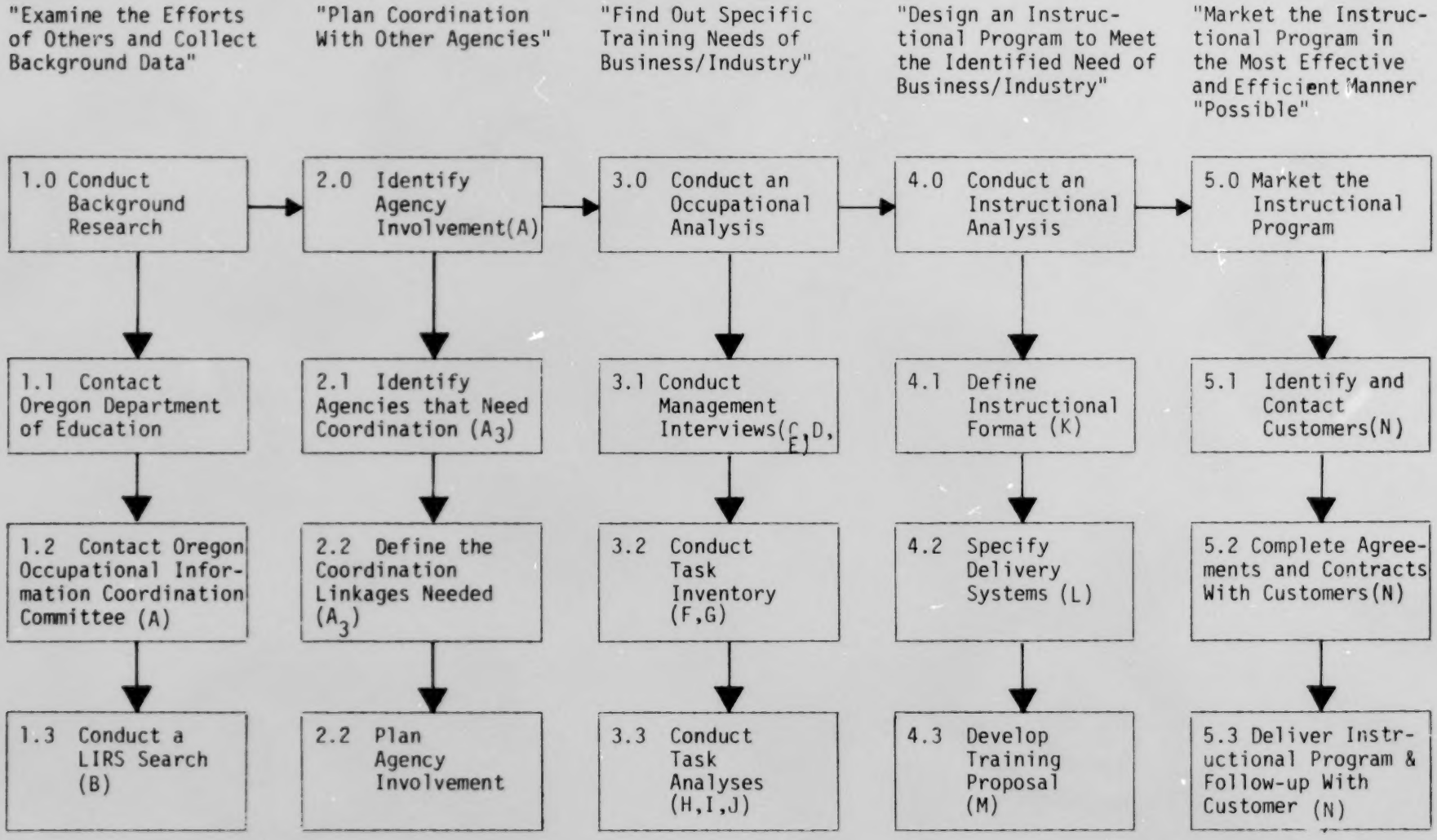
The model includes five major sections:

1) Conduct Background Research
2) Identify Agency Involvement
3) Conduct an Occupational Analysis
4) Conduct an Instructional Analysis
5) Market the Instructional Program

Each of these sections is broken down into smaller units. The smaller units are depicted by flow charts and operational steps are outlined for the reader.

Appendix items provide further clarification of the processes of this model.

MODEL FOR RETRAINING/TRAINING OF INDUSTRY EMPLOYEES
IN OREGON COMMUNITY COLLEGES


"Examine the Efforts of Others and Collect Background Data"
"Plan Coordination With Other Agencies"
"Find Out Specific Training Needs of Business/Industry"
"Design an Instructional Program to Meet the Identified Need of Business/Industry"
"Market the Instructional Program in the Most Effective and Efficient Manner "Possible"
1.0 Conduct Background Research
2.0 Identify Agency Involvement(A)
3.0 Conduct an Occupational Analysis
4.0 Conduct an Instructional Analysis
5.0 Market the Instructional Program
1.1 Contact Oregon Department of Education
2.1 Identify Agencies that Need Coordination (A_3)
3.1 Conduct Management Interviews(E,D,
4.1 Define Instructional Format (K)
5.1 Identify and Contact Customers(N)
1.2 Contact Oregon Occupational Information Coordination Committee (A)
2.2 Define the Coordination Linkages Needed (A_3)
3.2 Conduct Task Inventory (F,G)
4.2 Specify Delivery Systems (L)
5.2 Complete Agreements and Contracts With Customers(N)
1.3 Conduct a LIRS Search (B)
2.2 Plan Agency Involvement
3.3 Conduct Task Analyses (H,I,J)
4.3 Develop Training Proposal (M)
5.3 Deliver Instructional Program & Follow-up With Customer (N)

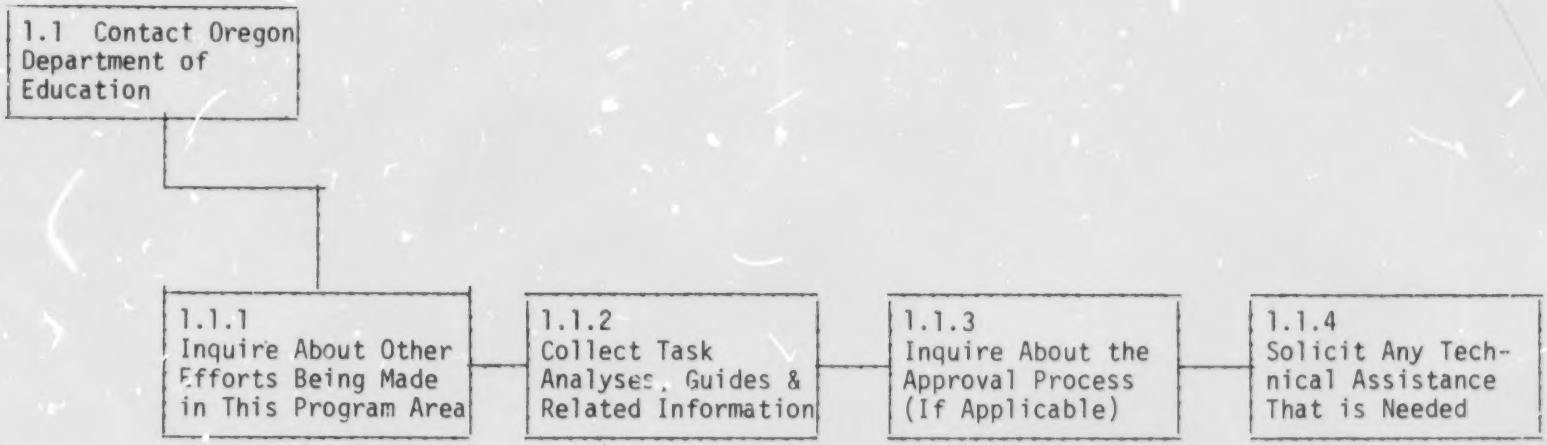
( ) Reference to Appendix Item

BACKGROUND RESEARCH

Regardless of the training program under consideration, similar efforts may have been made in other Oregon community colleges or in other states. A quick check of the state and national scene may prove helpful in program planning and development. Program planners can benefit from the success of others and glean ideas and strategies for their own programs. This model suggests ways to collect background research in a quick and efficient manner.

The Library Information Retrieval System (LIRS) is a good means for obtaining task inventory checklists for use as starters in developing a task inventory for making assessments of business and industry retraining/ training needs.

FLOW CHART FOR CONTACTING OREGON DEPARTMENT OF EDUCATION


1.1 Contact Oregon Department of Education
1.1.1 Inquire About Other Efforts Being Made in This Program Area
1.1.2 Collect Task Analyses, Guides & Related Information
1.1.3 Inquire About the Approval Process (If Applicable)
1.1.4 Solicit Any Technical Assistance That is Needed

Operational Steps

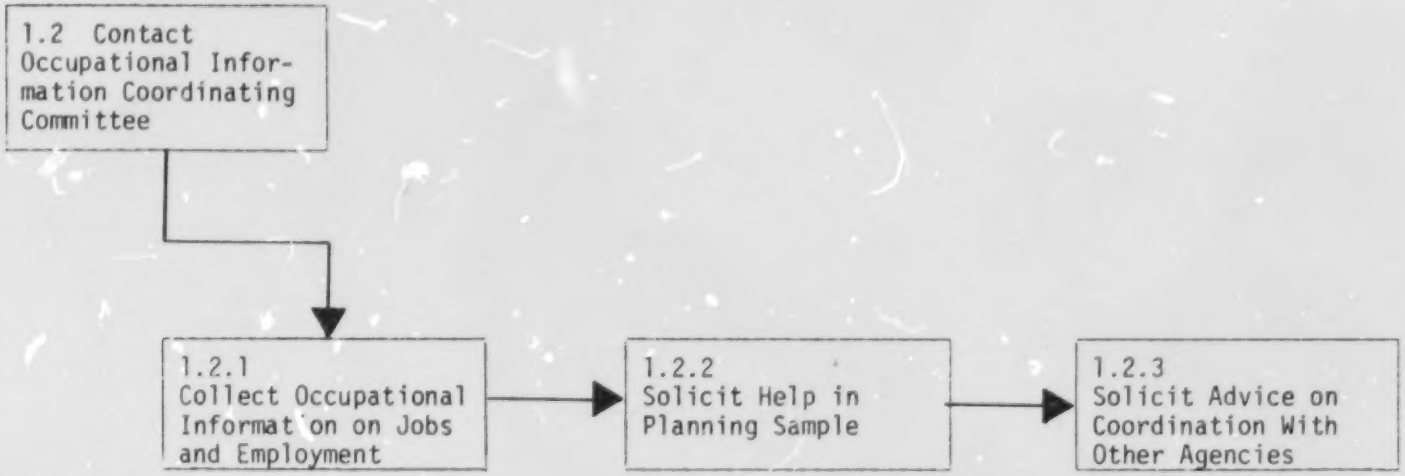
1.1.1 Contact Research and Exemplary Specialist at 378-2717 and ask if other community colleges are making similar efforts.

1.1.2 Contact appropriate subject area specialist and ask for task analyses and other background material that relates to the training project.

1.1.3 If program requires ODE approval for reimbursement, inquire about the process and what will be required.

1.1.4 Arrange for any technical assistance (ODE specialists) that will be needed in program development. Call specialist who has responsibility for the program area being developed.

FLOW CHART FOR CONTACTING OREGON OCCUPATIONAL INFORMATION COORDINATING COMMITTEE


1.2 Contact Occupational Information Coordinating Committee
1.2.1 Collect Occupational Information on Jobs and Employment
1.2.2 Solicit Help in Planning Sample
1.2.3 Solicit Advice on Coordination With Other Agencies

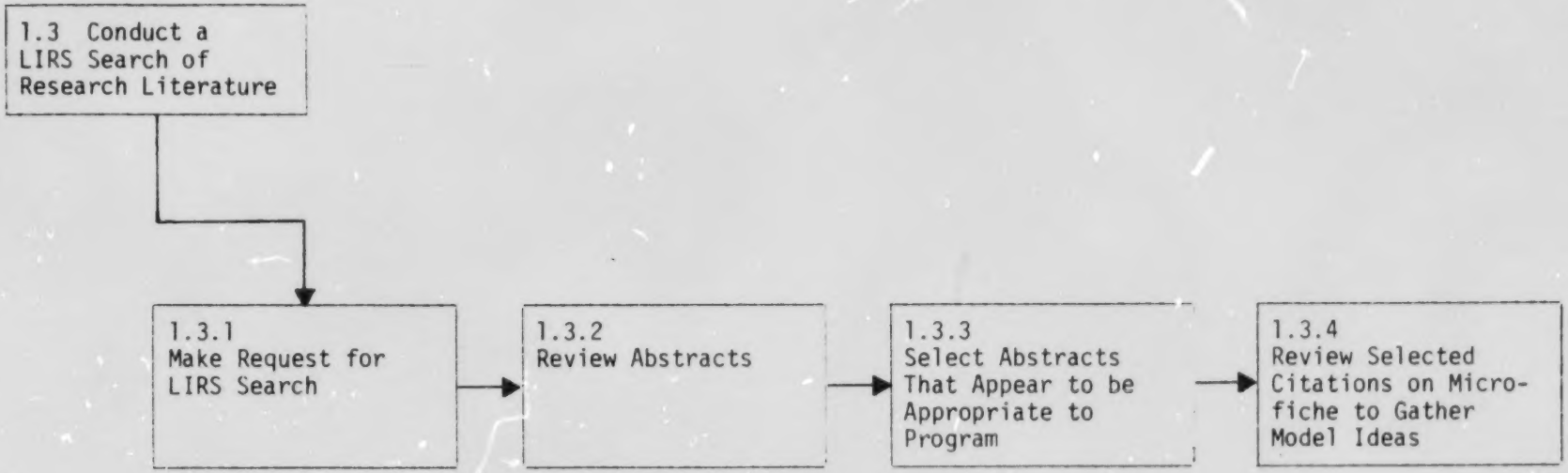
Operational Steps

1.2.1 Call Oregon Occupational Information Coordinating Network at 378-8146 and ask help in collecting employment data that pertains to the program being developed. (See Appendix A_1)

1.2.2 Solicit OOICC help in planning a sample of industries to be intereviewed, collect occupational characteristic data, supply and demand data and projections and trends information from OOICC or a network member such as CIS, SEARCH or OPPS. (See Appendix A_2)

1.2.3 Solicit OOICC advice on coordination requirements for dealing with other agencies on program development, i.e. The OPPS System of the Employment Division is part of the OOICC Network. (See Appendix A_3).

FLOW CHART FOR CONDUCTING A LIRS SEARCH


1.3 Conduct a LIRS Search of Research Literature
1.3.1 Make Request for LIRS Search
1.3.2 Review Abstracts
1.3.3 Select Abstracts That Appear to be Appropriate to Program
1.3.4 Review Selected Citations on Microfiche to Gather Model Ideas

Operational Steps

1.3.1 Read LIRS Materials in Appendix B_1, B_2, B_3.
Complete LIRS Search Request Form (Appendix B_2)
or Call OSU (754-2249) and make an appointment
or Call Oregon Department of Education and ask them to do it for you.

Request that citations be provided in abstract form rather than bibliography format.

1.3.2 Review abstracts to see if any citations are pertinent to the program being developed.

1.3.3 Select those abstracts that appear interesting and appropriate.

1.3.4 Review select citations on microfiche at Oregon State University Library and duplicate those portions of documents that will be useful to the project or program being developed.

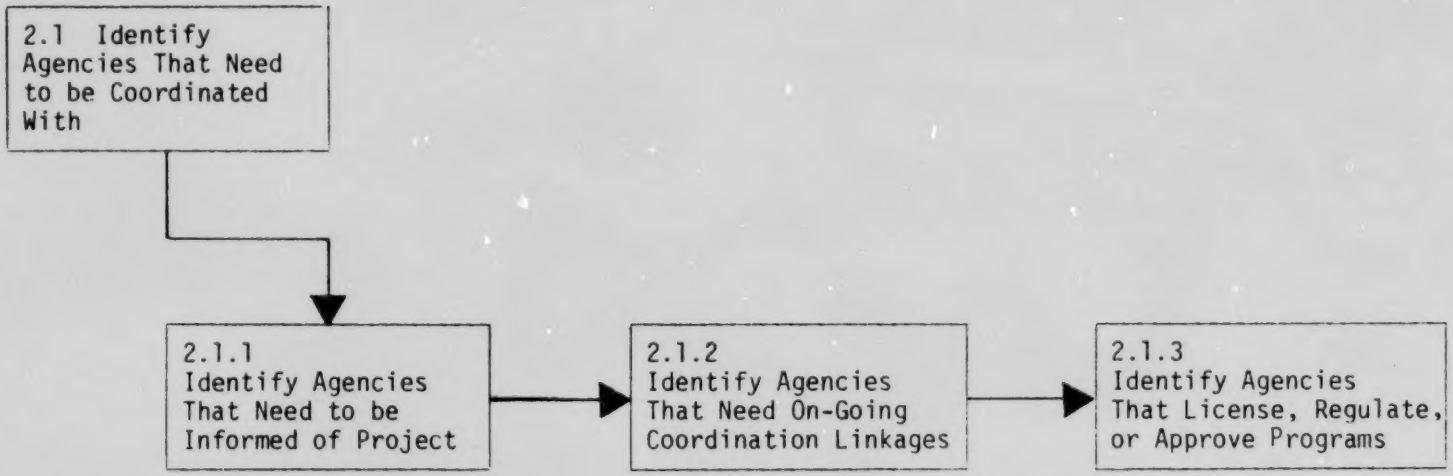
AGENCY INVOLVEMENT

Considerable time is devoted to coordinating with the many agencies that are involved directly or indirectly in the delivery of vocational training programs. This model is being developed for a quick response to the needs of business and industry for training/retraining of employees. In order to make a quick response, a short route through the maze of agency coordination must be identified.

This model attempts to define a process for coordinating with outside agencies in an effective and efficient manner. Agencies have been assessed for the types of information or assistance they can provide and key questions allow the program developer to coordinate with those agencies in a minimum timeframe.

The total model for agency coordination is found in Appendix A_3.

FLOW CHART FOR IDENTIFYING AGENCIES THAT NEED COORDINATION


2.1 Identify Agencies That Need to be Coordinated With
2.1.1 Identify Agencies That Need to be Informed of Project
2.1.2 Identify Agencies That Need On-Going Coordination Linkages
2.1.3 Identify Agencies That License, Regulate, or Approve Programs

Operational Steps

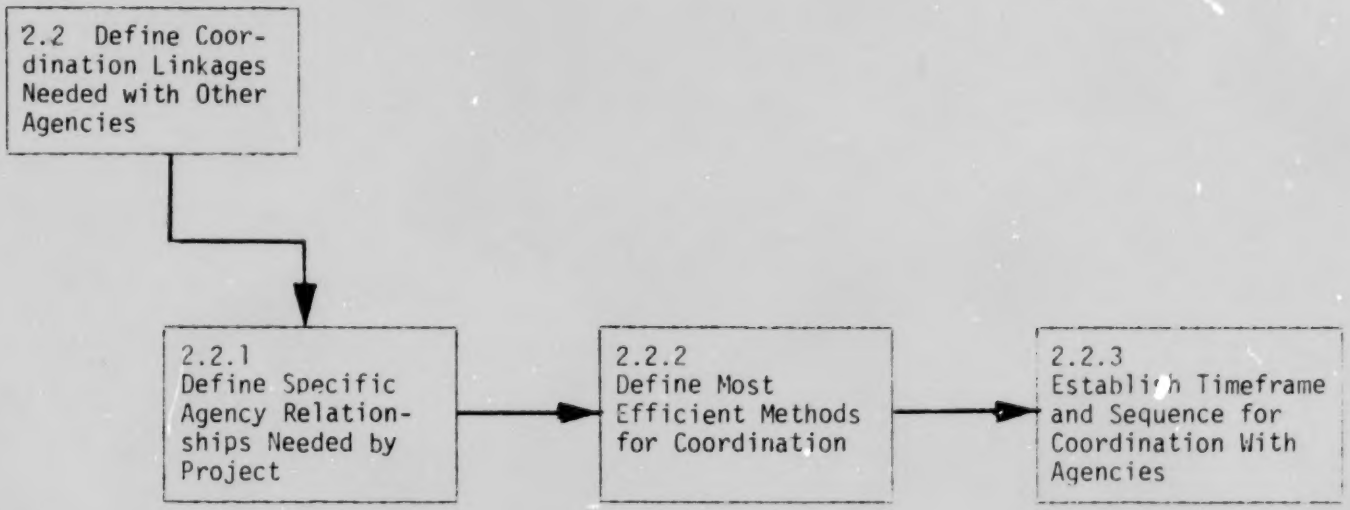
2.1.1 Review Appendix A_3 and identify which agencies need to be informed about the program being developed.

2.1.2 Identify agencies that need an on-going coordination linkage such as those providing clients. (CETA, Job Corps)

2.1.3 Identify agencies that license (License Boards), regulate (Unions), or approve (ODE, ECC) vocational programs.

NOTE: The Economic Development Agencies, Port Authorities and Chambers of Commerce should be contacted in those cases where new and emerging industries are involved in training programs.

FLOW CHART FOR DEFINING COORDINATION LINKAGES


2.2 Define Coordination Linkages Needed with Other Agencies
2.2.1 Define Specific Agency Relationships Needed by Project
2.2.2 Define Most Efficient Methods for Coordination
2.2.3 Establish Timeframe and Sequence for Coordination With Agencies

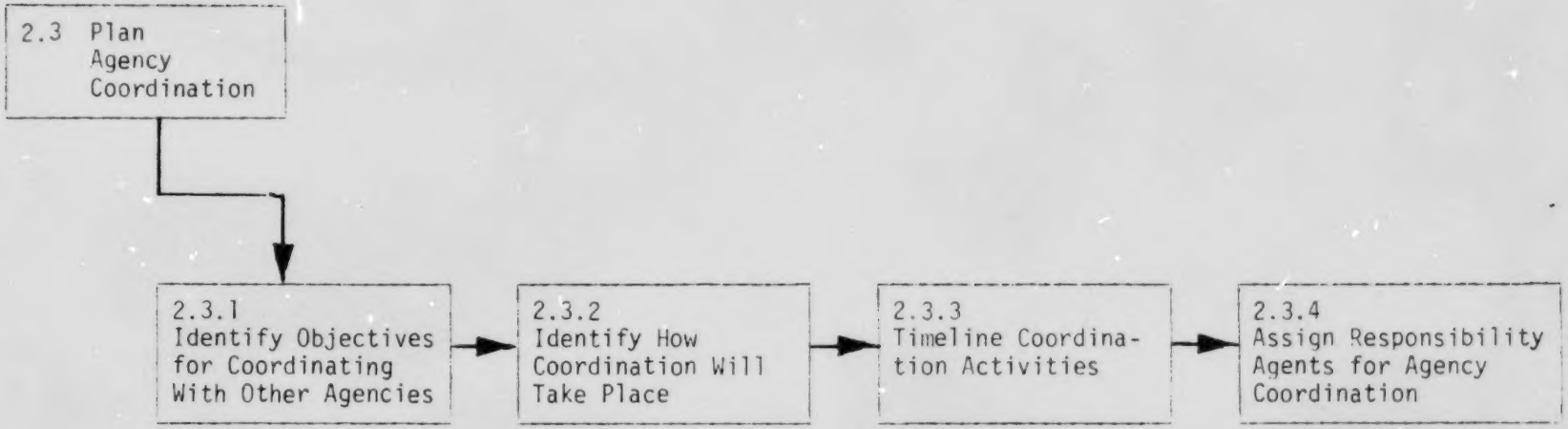
Operational Steps

2.2.1 Define (specific agencies) relationships needed for developing an effective program based on coordination needs rather than "nice to do" coordination. (Refer to Appendix A_3)

2.2.2 Define the most efficient method for developing each of the coordination relationships identified in 2.2.1.

2.2.3 Develop timelines and sequences for coordinating with the various agencies so that program development will not become high-centered to await the decision of some agency. Timelines should anticipate problem areas.

FLOW CHART FOR PLANNING AGENCY COORDINATION


2.3 Plan Agency Coordination
2.3.1 Identify Objectives for Coordinating With Other Agencies
2.3.2 Identify How Coordination Will Take Place
2.3.3 Timeline Coordination Activities
2.3.4 Assign Responsibility Agents for Agency Coordination

Operational Steps

2.3.1 Identify objectives (What is to happen?) for coordination with other agencies so that results are obtained rather than just meetings and talk.

2.3.2 Identify strategies (How will coordination take place?) for coordination with other agencies.

2.3.3 Timeline activities to assure that coordination is timely and properly sequenced.

2.3.4 Assign a responsibility agent for each coordination activity to assure that someone is responsible for completion.

OCCUPATIONAL ANALYSIS

To properly assess the training/retraining needs of business and industry, an inventory of specific job skills must be made. Tasks and attitudes for successful employment offer a realistic base for developing curriculum and training programs.

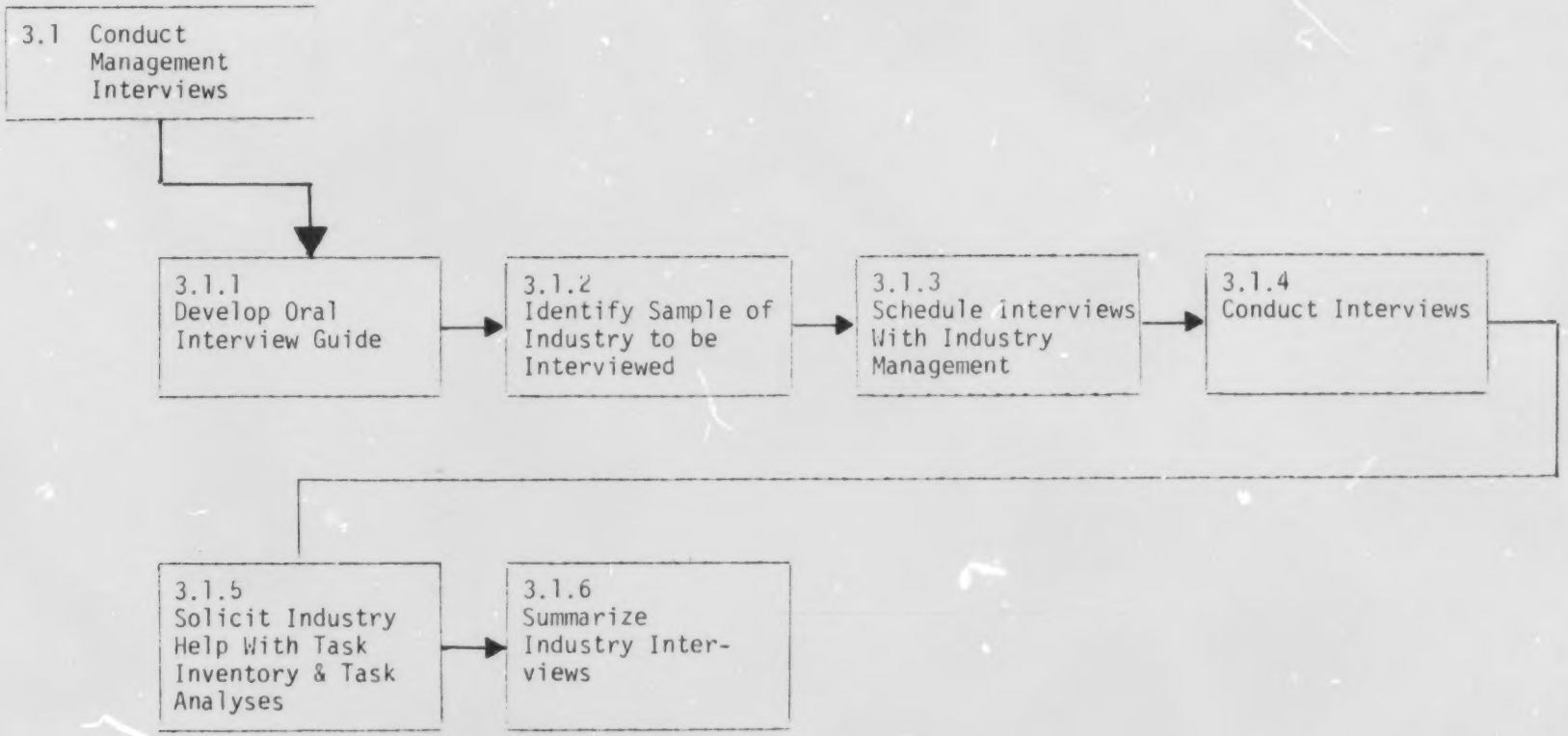
This model utilizes the standard procedures for task inventory and task analysis as recommended by Ohio State University. Existing task analyses are utilized for developing the task inventory checklist. Supervisors and technicians in industry respond to the task inventory according to the needs of their own firm. Returns are tallied by computer by Oregon Employment Statistics (OES) code and SIC code and as a composite of all respondents. The task inventory results are utilized to develop a task analysis which is reviewed by industry supervisors and technicians for their ratings. The completed task analyses are also tallied by computer and the task analysis will be developed for each OES code and SIC code and as a composite of all those that responded to the task analysis.

Oral interviews with management provide related information about the training needs of industry.

Employment data, occupational profiles and trends in employment are collected from the Oregon Occupational Information Network and the Employment Division. This information is collected at the beginning of program development and serves as a basis for interviews of managers in industry.

Both general and specific information are utilized in developing a training program. General information is helpful in design of a program while specific information (task analyses) is essential for development of vocational curriculum.

FLOW CHART FOR CONDUCTING MANAGEMENT INTERVIEWS


3.1 Conduct Management Interviews
3.1.1 Develop Oral Interview Guide
3.1.2 Identify Sample of Industry to be Interviewed
3.1.3 Schedule interviews With Industry Management
3.1.4 Conduct Interviews
3.1.5 Solicit Industry Help With Task Inventory & Task Analyses
3.1.6 Summarize Industry Interviews

Operational Steps

3.1.1 Develop an oral interview guide based on questions for which answers are needed. (See Appendix C_1) In cases where time will not permit on-site interviews, a mail survey can be utilized. (See Appendix C_2)

3.1.2 Identify industry sample to be interviewed by multiplying staff days available for interviews by 4 interviews per days. The product will be the number of industries to be interviewed. Add 30-50% alternates to allow for those industries that choose not to cooperate with the interviews. Request

3.1.2 Contd. OOICC and State Employment Division assistance in selecting a valid sample. The sample should be stratified by firm size and geographic location. The sample may be specific to regions or statewide. Call OOICC (378-8146) as a starting point for identifying a sample. (See Appendix D) If OOICC cannot supply actual sample, use Directory of Oregon Manufacturers, telephone directories or other sources for identifying sample names and addresses. Use a table of random numbers and select firms from stratified lists that represent SIC and OES codes desired in study.

3.1.3 Schedule management interviews with industry by telephoning their personnel manager; describing the purpose of the interviews; and asking for a one hour interview. (See Appendix E)

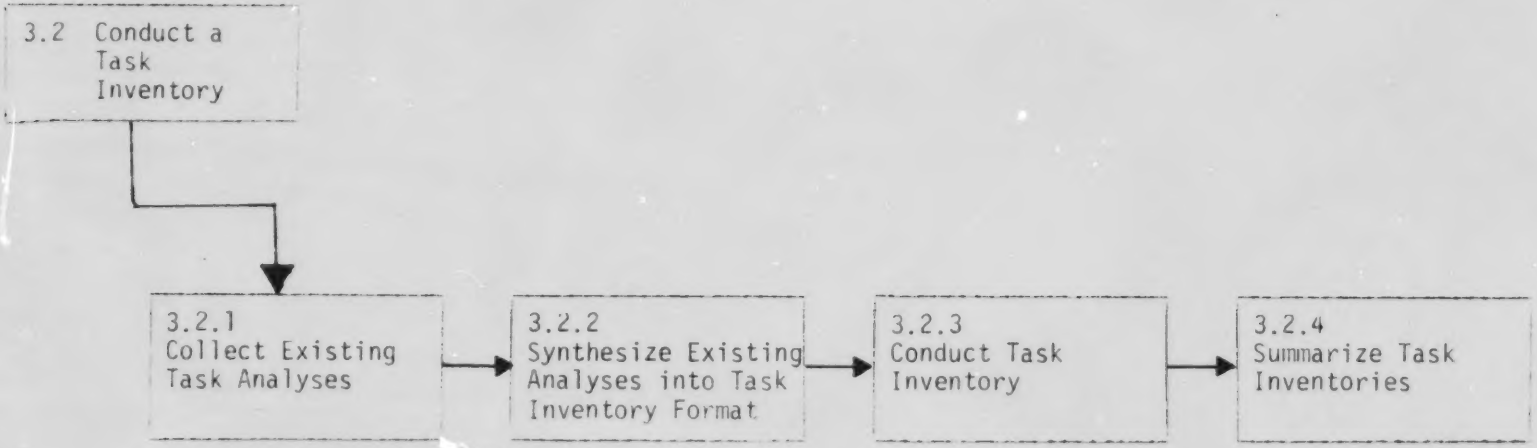
3.1.4 Conduct oral interviews, utilizing the oral interview guide to assure that consistent information is being compiled.

3.1.5 At close of interviews, ask the personnel manager if one supervisor and one technician would respond to the task inventory and task analyses. If possible, visit directly with supervisor and technician to gain their commitment to the task inventory and task analyses process.

3.1.6 Summarize management interviews by making a composite of each response item, noting commanlities and differences.

NOTE: A modification of the management interview process will be necessary when developing short term training programs for business and industry. For instance, the sampling process will not be necessary when developing programs for specific target firms. The interview process is recommended for working with a single firm or many firms within an industry. The recommended procedures for highly specific, short-term programs are: (1) Interview managers and supervisors of technicians and (2) identify tasks to be included in training program, using the task inventory as a shopping list.

FLOW CHART FOR CONDUCTING A TASK INVENTORY


3.2 Conduct a Task Inventory
3.2.1 Collect Existing Task Analyses
3.2.2 Synthesize Existing Analyses into Task Inventory Format
3.2.3 Conduct Task Inventory
3.2.4 Summarize Task Inventories

Operational Steps

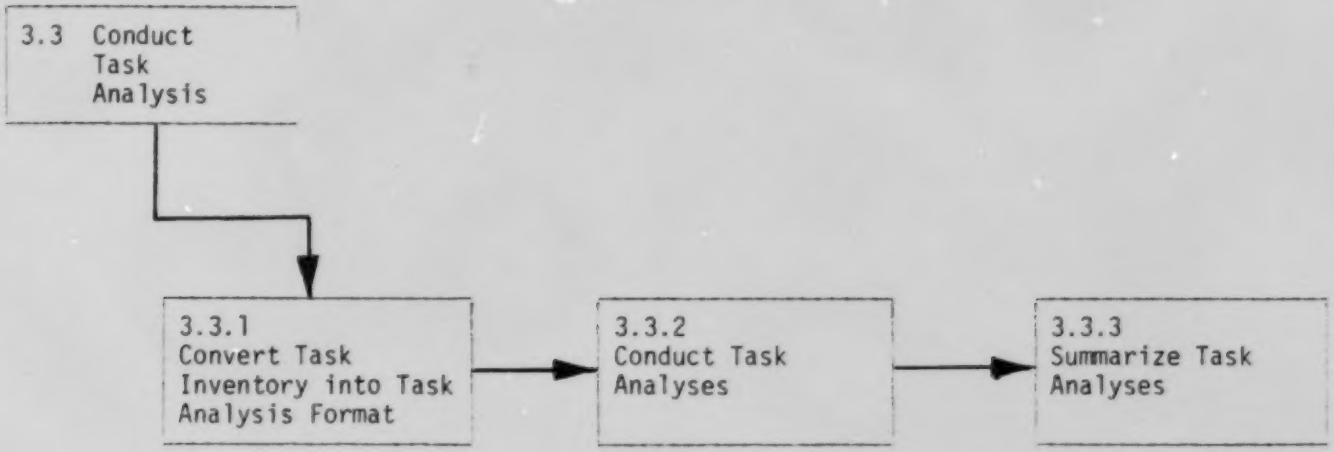
3.2.1 Collect existing task analyses from ODE and/or LIRS Search that represent the OES or D.O.T. job classifications that are to be represented in the training program.

3.2.2 Synthesize the task analyses into a listing of duties and tasks and a "check" column. (See Appendix F) This is a task inventory. Program advisory committees should be involved in this process.

3.2.3 Conduct task inventory by having a supervisor of technicians and a technician from many firms check those skills that are needed in their industry.

3.2.4 Collect completed task inventories and send them to OSU Computer facility and ask for analysis as shown in Appendix G. A Fortran program for the tally of the task inventories is included in in Appendix G.

FLOW CHART FOR TASK ANALYSES


3.3 Conduct Task Analysis
3.3.1 Convert Task Inventory into Task Analysis Format
3.3.2 Conduct Task Analyses
3.3.3 Summarize Task Analyses

Operational Steps

3.3.1 Using OSU Computer tally, revise task list and type into a task analyses format with columns for entry level, level of difficulty and frequency of use. (See Appendix H)

3.3.2 Mail the task analyses sheets to select people and have them respond to entry level, level of difficulty and frequency of use for each task statement. An example cover letter is shown as Appendix I.

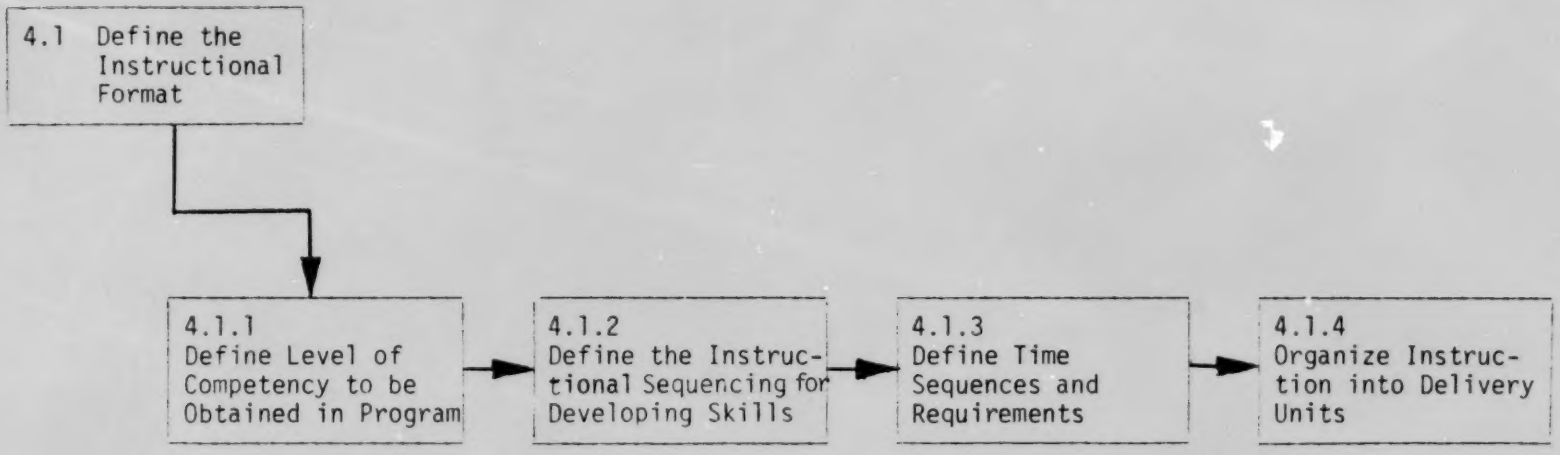
3.3.3 Summarize task analyses returns by computer tally and analysis. See Computer Program Instructions in Appendix J.

INSTRUCTIONAL ANALYSIS

Once industry needs have been determined, the results must be transformed into training specifications and an instructional format that can be delivered to customers. The instructional format must be defined; a delivery system specified; and a training proposal developed that will explain the instructional content, format and delivery system to the customer.

This model recommends an approach for converting task analyses findings into instructional format. Process steps for making this transformation are offered in the flow charts, operational steps and related appendix items.

FLOW CHART FOR DEFINING INSTRUCTIONAL FORMAT


4.1 Define the Instructional Format
4.1.1 Define Level of Competency to be Obtained in Program
4.1.2 Define the Instructional Sequencing for Developing Skills
4.1.3 Define Time Sequences and Requirements
4.1.4 Organize Instruction into Delivery Units

Operational Steps

See Example in Appendix K

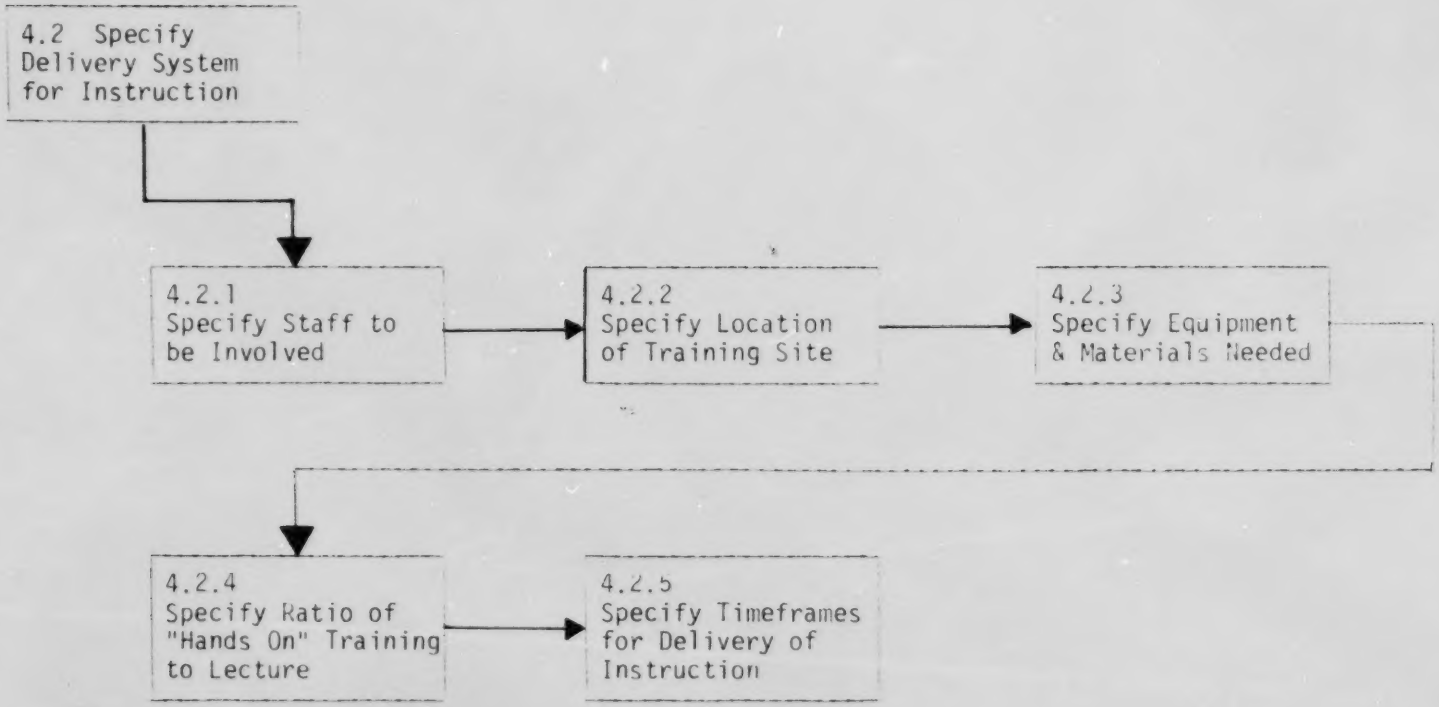
4.1.1 Define the competency level that is required by industry for the specific training program being planned. Mathematics and communications skills levels should also be defined.

4.1.2 Sequence tasks in an order that allows a building block effect for skills development.

4.1.3 Define time requirements for each sequence of tasks; optimum time structure for theory and lab work; and total instructional time to develop required competence in identified tasks.

4.1.4 Organize instructional sequences into delivery units such as courses, seminars, workshops, or individualized packet material.

FLOW CHART FOR SPECIFYING DELIVERY SYSTEM


4.2 Specify Delivery System for Instruction
4.2.1 Specify Staff to be Involved
4.2.2 Specify Location of Training Site
4.2.3 Specify Equipment & Materials Needed
4.2.4 Specify Ratio of "Hands On" Training to Lecture
4.2.5 Specify Timeframes for Delivery of Instruction

Operational Steps

See Example in Appendix L

4.2.1 Specify number of staff needed and names of staff that will be making delivery of instructional program. State whether staff is provided by the business, industry or community college.

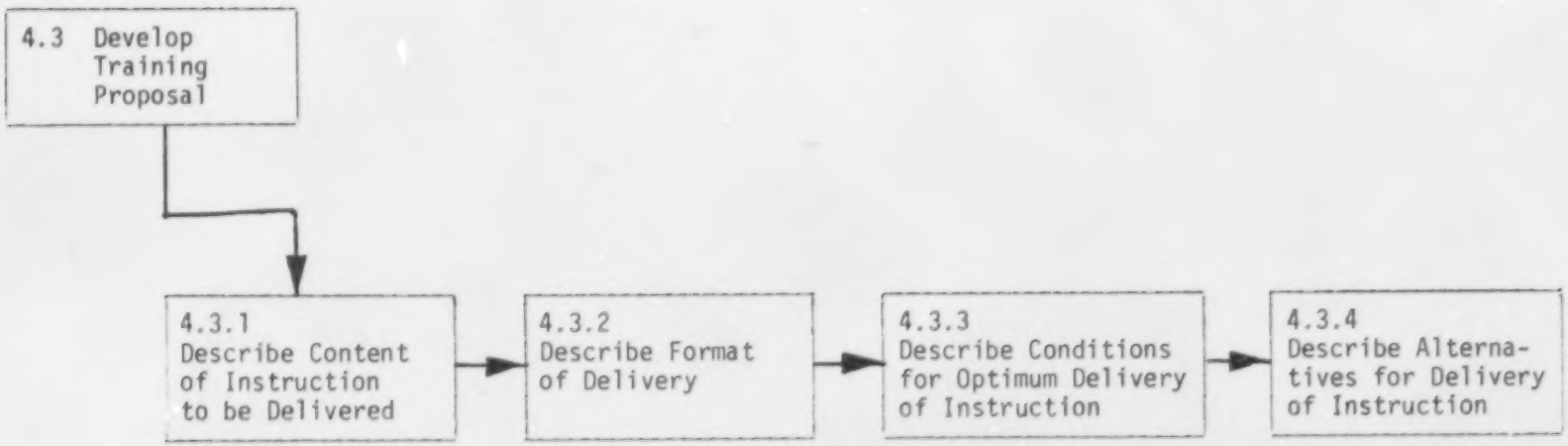
4.2.2 Specify where the training program will be conducted, i.e. community college, industry or business site.

4.2.3 Specify equipment and materials needed and who is responsible for providing them to program.

4.2.4 Specify whether delivery will be theory, hands-on or a mix of theory and practice. Industry will want to know percentages of "hands-on" instruction.

4.2.5 Specify timeframes for total program and individual classes to achieve optimum outcomes for training program. Be specific as to time, day, starting date and ending date of training program.

FLOW CHART FOR DEVELOPING A TRAINING PROPOSAL


4.3 Develop Training Proposal
4.3.1 Describe Content of Instruction to be Delivered
4.3.2 Describe Format of Delivery
4.3.3 Describe Conditions for Optimum Delivery of Instruction
4.3.4 Describe Alternatives for Delivery of Instruction

Operational Steps

See Example in Appendix M:

4.3.1 Describe the general content of instruction to be delivered to industry and/or students in regular classes. (WHAT)

4.3.2 Describe the format for delivery of the instructional program. (HOW)

4.3.3 Describe the most appropriate conditions for delivering instruction. (WHEN, WHERE)

4.3.4 Describe any alternatives for delivery that may make it more feasible for industry involvement.

MARKETING INSTRUCTIONAL PROGRAMS

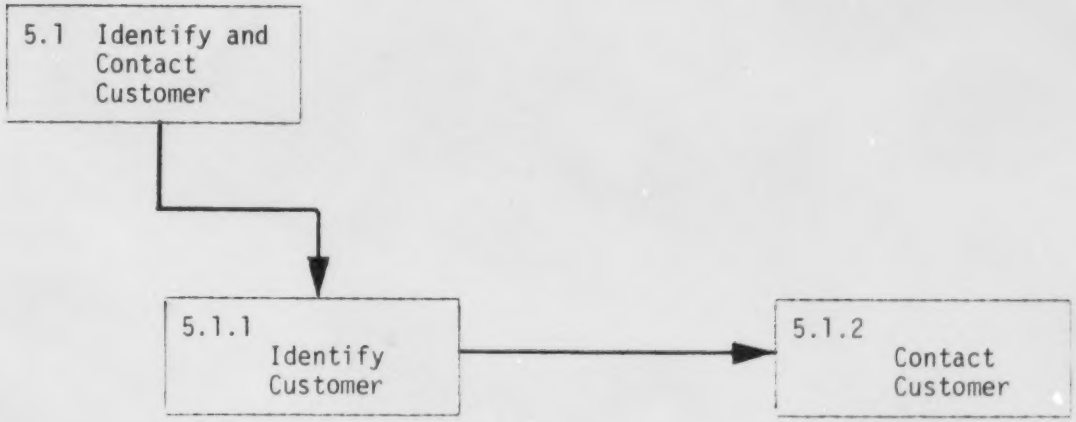
With a well developed training proposal, the community college is ready to market its instructional program. This requires that customers be identified; contacted with a training proposal; agreements reached; contracts signed, programs delivered; and a follow-up conducted with the customer. This component of the model must be well defined and properly presented to industry if community colleges are to be competitive in the training/retraining of industry employees.

Portland Community College has a long record in the marketing of instruction to industry. They have contributed their User's Guide to Educational Marketing as the marketing component of this model. The guides' 15 sections are referenced to the processes of the model. The complete guide is included as Appendix N of the model.

Since the User's Guide was developed by a separate team of planners, it is not directly referenced to the activities of the model. The relationship of model activities to the User's Guide to Educational Marketing is shown in the following matrix:

ACTIVITIES IN MODEL		SECTIONS IN USER'S GUIDE
5.1.1	Identify Customer	Section 2
5.1.2	Contact Customer	Section 3
5.2.1	Review Training Proposal With Customer	Sections 4 and 5
5.2.2	Work out Pricing Configurations	Section 6
5.2.3	Complete Agreement on Training Program	Section 7
5.2.4	Complete Contract with Customer	Section 7
5.3.1	Prepare for Instructional Delivery	Sections 8, 9, 10, 11, 12
5.3.2	Deliver the Instructional Program	----------
5.3.3	Follow-up with Customer	Sections 13, 14, 15

FLOW CHART FOR IDENTIFYING AND CONTACTING CUSTOMERS

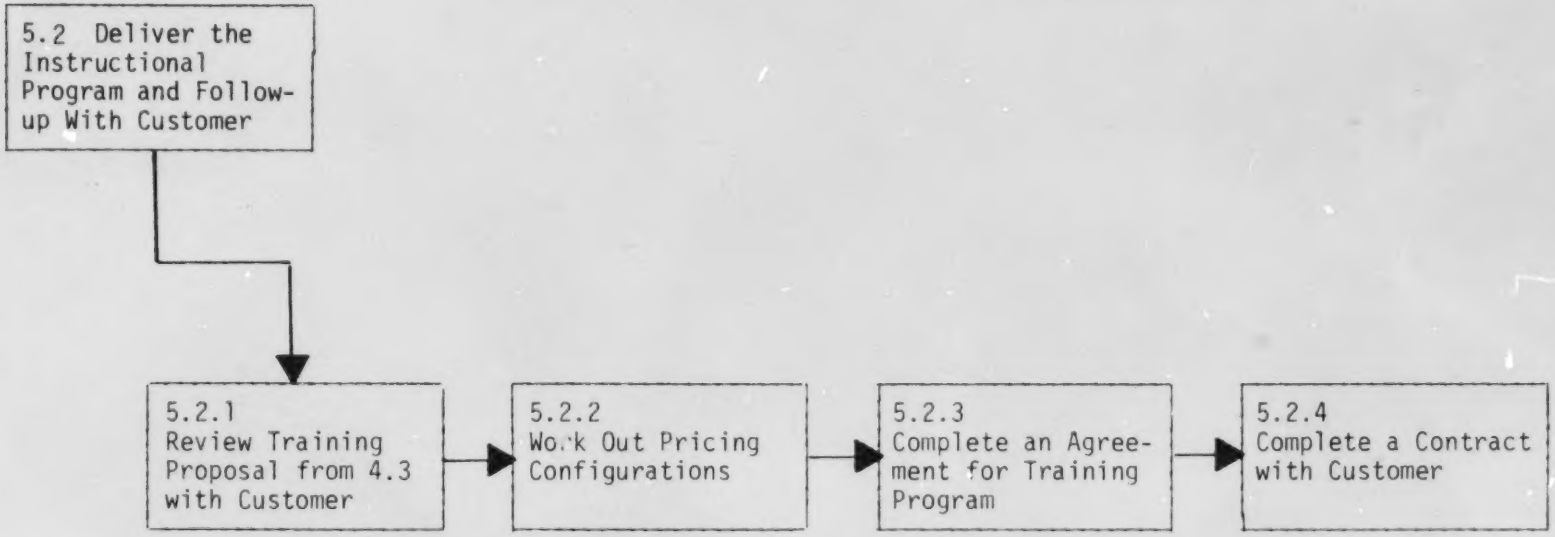


Operational Steps

5.1.1 Customers are either identified at the beginning and involved in the task analysis process; or a training program is developed about industry needs followed by customer identification. An example of customer identification procedures is found in Appendix M (Section 2).

5.1.2 Customer contact may be handled in a variety of ways. Portland Community Colleges' procedure for making customer contact is given as an example in Appendix N (Section 3).

FLOW CHART FOR DELIVERY OF INSTRUCTIONAL PROGRAM


5.2 Deliver the Instructional Program and Follow-up With Customer
5.2.1 Review Training Proposal from 4.3 with Customer
5.2.2 Work Out Pricing Configurations
5.2.3 Complete an Agreement for Training Program
5.2.4 Complete a Contract with Customer

Operational Steps

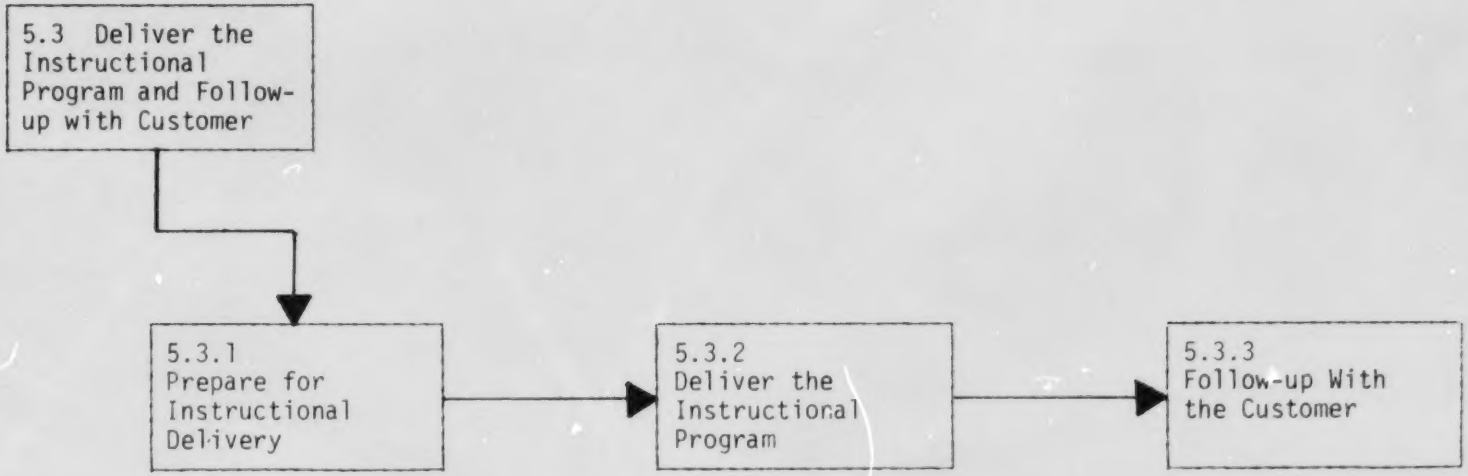
5.2.1 Review the training proposal with customer to assure that customer understands content, format and delivery of proposed training program (Appendix N, Sections 4 and 5).

5.2.2 Using the pricing schedule (Appendix N, Section 6), explain the costs of the training program, with alternative price configurations clearly defined.

5.2.3 Write an agreement to include revisions and modifications of the training program and costs to the customer (See Appendix N, Section 7).

5.2.4 Complete a contract with customer for delivery of the training program. An example contract is found in Appendix N (Section 7).

FLOW CHART FOR DELIVERY OF INSTRUCTIONAL PROGRAM


5.3 Deliver the Instructional Program and Follow-up with Customer
5.3.1 Prepare for Instructional Delivery
5.3.2 Deliver the Instructional Program
5.3.3 Follow-up With the Customer

Operational Steps

5.3.1 Recruit and/or select staff; provide promotion and publicity; identify equipment and supplies and who will provide them; develop instructional materials for program; register students in class. Examples of procedures are included as Appendix N (Sections 8, 9, 10, 11, 12).

5.3.2 Operate the instructional program.

5.3.3 Follow-up with the customer. Example billing procedures, evaluation and follow-up procedures are included as Appendix N (Sections 13, 14, 15).

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SECTION 7 - WRITING A SPECIAL AGREEMENT FOR CONTRACTED SERVICES

SECTION 8 - PROMOTION AND PUBLICITY

SECTION 9 - TEXTBOOKS

SECTION 10 - SUPPORT SERVICES

SECTION 11 - LAST MINUTE DETAILS

SECTION 12 - REGISTERING THE STUDENTS

SECTION 13 - BILLING THE CUSTOMER

SECTION 14 - EVALUATING THE CUSTOM DESIGNED PROGRAM

SECTION 15 - CUSTOMER FOLLOW-UP

O SPECIFIC PROCESS FLOW CHARTS

1 - PROCESS FOR SETTING UP MANAGEMENT INTERVIEWS

2 - PROCESS FOR CONDUCTING MANAGEMENT INTERVIEWS

3 - PROCEDURES FOR UTILIZING A DELPHI GROUP

4 - SYNTHESIZING TASK INVENTORIES FROM EXISTING TASK ANALYSES

5 MATRIX FOR SUMMARIZING MANAGEMENT INTERVIEWS

P TRANSPARENCY MASTERS FOR EXPLAINING THE MODEL

HOW DO I GET INFORMATION?

There are a number of delivery systems within the NETWORK that provide up-to-date occupational information. The major systems are:

LABOR MARKET INFORMATION (LMI): LMI both develops and delivers data for planners and encompasses facts, analyses and characteristics with respect to the following subjects:

economic trends	unemployment
employment	income
labor force	job openings
population	job applicants

Contact: Donavon R. Steward
Assistant Administrator for
Research & Statistics
Employment Division
875 Union Street, N.E.
Salem, Oregon 97311
Phone: 378-3219

CAREER INFORMATION SYSTEM (CIS): Computerized, keysort and hard copy Career Information for counselors and clients; a public consortium based at the University of Oregon.

Contact: Bruce McKinlay, Director
Career Information System
247 Hendricks Hall
University of Oregon
Eugene, Oregon 97403
Phone: 686-3872

OCCUPATIONAL PROGRAM PLANNING SYSTEM (OPPS): OPPS is a related occupational information delivery system providing information specifically for planners. OPPS provides OOICC/Employment Division occupational demand and supply data for vocational education and industrial economic planners.

Contact: David Allen, Coordinator
Occupation Program Planning System
Employment Division
875 Union Street, N.E.
Salem, Oregon 97311
Phone:378-6400

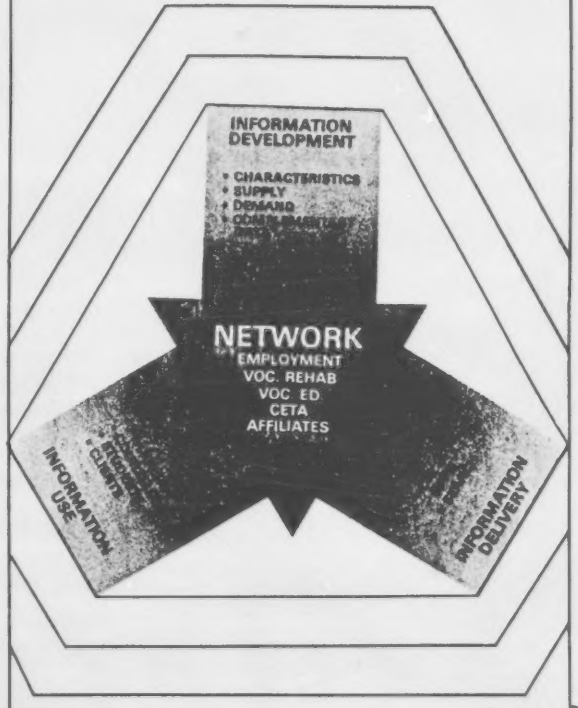
SYSTEMS EXPLORATION AND RESEARCH FOR CAREER HELP (SEARCH): Counseling, career guidance and occupational information for individual career decision-making: A program available through the Oregon Employment Division.

Contact: Paul Kerr, Supervisor
Employment Division Testing and Counseling Unit
875 Union Street, N.E.
Salem, Oregon 97311
Phone: 378-8289

WHERE ELSE CAN I GET INFORMATION?

The OOICC and other members of the Network have produced *A Directory of Occupational and Educational Information Sources for Counselors/Planners/Students/Clients.* The directory provides a description of and information on how to obtain over 100 sources of occupational and educational information. To obtain a copy, or for more information about the Committee and the Occupational Information Network, contact Dave Fretwell, Executive Secretary, 875 Union Street, N.E., Salem, Oregon 97311 - Phone 378-8146.

GUIDE TO OCCUPATIONAL INFORMATION: AN OREGON NETWORK



STATE OF OREGON

WHAT IS THE OREGON OCCUPATIONAL INFORMATION NETWORK?

The Oregon Occupational Information Coordinating Committee (OOICC) was initiated under Federal Legislation and operates under a Governor's Executive Order. Its purpose is to "implement an occupational information NETWORK". The Oregon NETWORK is built upon existing public and private agency and institutional resources. The NETWORK refers to an interconnected group of persons, programs and systems established for the purpose of developing, delivering and using occupational information.

HOW IS THE NETWORK ORGANIZED?

The formal structure of the NETWORK consists of statutory members of the OOICC (Dept. of Education, Employment Division, Vocational Rehabilitation Division and CETA Programs), its affiliate members (representing many agencies and organizations) and its staff.

WHO USES THE NETWORK?

Guidance/Career Counselors

Economic Planners

Education & Training Program Planners

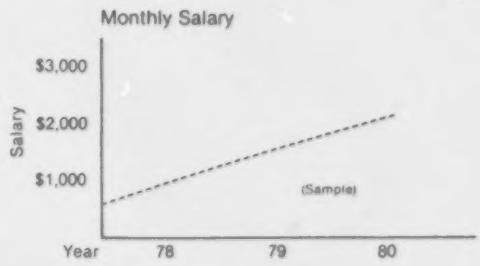
Educators/Administrators

Clients/Citizens/Students

WHAT KINDS OF INFORMATION ARE WITHIN THE NETWORK?

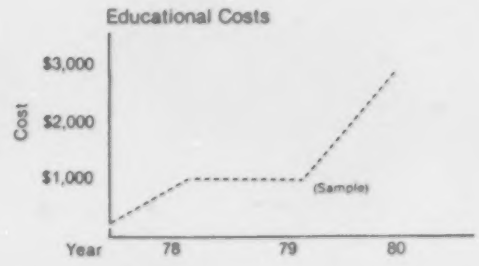
OCCUPATIONAL CHARACTERISTICS

Information that describes an occupation including its duties, responsibilities, wages, working conditions, eligibility, experience, and educational requirements, etc.



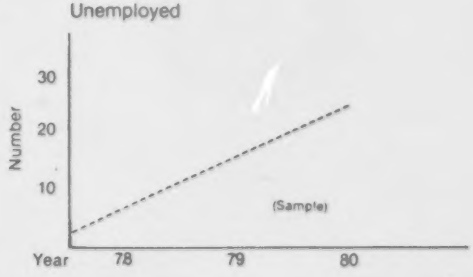
COMPLEMENTARY INFORMATION

Information that is needed to provide depth and understanding for effective planning, career guidance and exploration. This information includes data on educational and training programs, labor force demographic and economic trends.



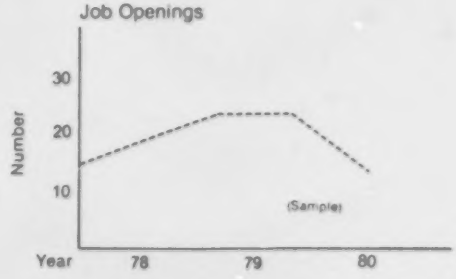
LABOR SUPPLY

Information on the number of workers available and qualified to fill jobs in an occupation. This data includes those currently working, those unemployed, and the projected number of workers expected in the future, including those completing training programs.



LABOR DEMAND

Information concerning the number of job opportunities in a specific occupation. This data includes both the number of jobs presently filled in an occupation and the number of job openigs.



WHAT IS OPPS?

OPPS is specifically designed as a "ONE STOP" center for occupational program planners and economic industrial planners who require basic information on the supply and demand of workers in specific occupations. This information can be used in developing, continuing or terminating specific programs. Other individuals, such as counselors, may also make use of the system. OPPS is one of the four key data delivery systems in the Oregon Occupational Information NETWORK.

WHAT SERVICES ARE AVAILABLE?

OPPS has four major components.

1. *A computerized data bank of occupational supply/demand data.* This is currently operational and can provide information summaries at various levels.

2. *User service and training personnel.* Staff are now available to help you clearly define your information needs and interpret the information provided to you.

3. *Annual supply/demand publications.* Prototype publications have been printed. More extensive publications will be available in 1981.

4. *Training program projection model.* This model will help program planners project new programs based on occupational supply/demand data. It will be computerized in 1981.

WHAT INFORMATION IS ACTUALLY AVAILABLE FROM OPPS?

1. *Occupational DEMAND Information* that originates from the Employment Division Occupational Employment Survey (OES) System including:
   - STATEWIDE past, current and future employment.
   - STATEWIDE occupational expansion and replacement needs for the next 6 years.
   - LOCAL current employment and replacement needs for the next 6 years. (Governor's Administrative Districts 2, 3, 4, 5, 7, and 8 are now available and data for other administrative districts will be added in 1980.)

2. *Occupational SUPPLY Information* that originates from a number of different information systems including:
   - high school vocational program "available for placement" data,
   - community college vocational program completion data,
   - university completion data,
   - apprenticeship data,
   - private school data,
   - Vocational Rehabilitation Division data,
   - additional occupational supply data from the Employment Division, CETA, Corrections and WIN programs are being added as they are obtained.

3. *Occupational Characteristics date.* This component will include such information as: job descriptions, wages, training/skill requirements, work settings and conditions and hiring channels. This information is not yet fully available; however, job titles and descriptions can be provided for all occupations in the system.

HOW IS THE INFORMATION ORGANIZED?

The data are organized by three different occupational groupings.

1. *Nineteen (19) broad occupational Clusters* that encompass all occupations in Oregon. These are usually used in planning generalized training programs such as those found in high schools.

2. *Two hundred twenty five (225) specific occupational training areas.* These are subcategories of the 19 Cluster areas. United States Office of Education (USOE) and Higher Education General Information System (HEGIS) codes are used for these 225 groupings.

3. *Fifteen hundred (1,500) individual occupational codes.* These represent specific Occupational Employment Survey (OES) codes.

HOW ARE SUPPLY/DEMAND INFORMATION COMPARED?

The most specific level of occupational DEMAND information is the OES code (approximately 1,500 occupations). Most occupational SUPPLY information is available at the USOE/HEGIS level (approximately 225 training areas). Supply/demand comparisons are normally made at this level.

HOW DOES THE SYSTEM OPERATE?

OPPS operates under a Policy Agreement signed by the four Oregon Occupational Information Coordinating Committee (OOICC) statutory members. This agreement specifies that general system Management and Policy direction is under the auspices of OOICC. An advisory subcommittee, representing a broad group of planners, provides input to system policy for the OOICC Board.

The Technical Operator of the system, the Research and Statistics Section of the Employment Division, provides staff support, services and facilities.

HOW DO I ACTUALLY GET INFORMATION?

1. *Define occupations of interest.* If possible, specify one or several occupations about which you need information.

2. *Determine the types of DEMAND information you require:*
   statewide employment and demand,
   local employment and demand (specified by Governor's Administrative District).

3. *Determine the types of SUPPLY information you require:*
   high school, community college, CETA, university, apprenticeship, etc.

4. *Write or telephone your request to:*

   Employment Division
   RESEARCH & STATISTICS
   875 Union Street N.E.
   Salem, Oregon 97311

   Toll Free: 1-800-452-7813 ext. 8-6400
   Direct: 378-6400

   Your information can normally be mailed within 24 hours.

OREGON OCCUPATIONAL INFORMATION COORDINATING COMMITTEE (OOICC)

The Committee operates under a Governor's Executive Order and its purpose is to improve the quality, dissemination and coordination of labor market and educational information for use by member agencies and others including those involved in individual counseling and institutional planning. Statutory members are the Oregon Department of Education's Vocational Education Section, the Vocational Rehabilitation Division, the Employment Division and CETA Programs. Affiliate members include a number of other organizations with interest in the purposes of the Committee as appointed by the Governor.

For general information about the Occupational Information NETWORK being developed or any of the systems within the Network, contact Dave Fretwell, Executive Secretary, OOICC, 875 Union St. NE, Salem, OR 97311, Phone 378-8146.

LABOR MARKET INFORMATION

LMI is another key component of the Oregon Occupational Information NETWORK. LMI both develops and delivers data for planners and encompasses facts, analyses and characteristics with respect to the following subjects:

economic trends	unemployment
employment	income
labor force	job openings
population	job applicants

For more information contact:

Donavon R. Steward
Assistant Administrator for
Research & Statistics
Employment Division
875 Union Street NE
Salem, Oregon 97311
Phone 378-3219

Occupational PROGRAM PLANNING SYSTEM

Occupational Supply Demand Information

STATE OF OREGON
EMPLOYMENT DIVISION
DEPARTMENT OF HUMAN RESOURCES

MODEL FOR AGENCY INVOLVEMENT

Purpose	A Define the Industries and Occupations to be Considered	B Collect Initial Information for Assessing Training & Industry Needs	C Collect Additional Data from Local Training Institutions & Industry	D Determine Condtions for Program Approval, I. Licensing, Etc.)
Major Input Groups	- Local Labor Market Economist - Local Economic Development Committee - State Economic Division - State Employment Division - Oregon Occupational Information Coordinating Committee - Community Colleges and/or other related training institutions - Community interest i.e. Chamber of Commerce - Client Interest i.e. CETA, Voc. Rehab.	- Oregon Occupational Information Coordinating Committee will identify contacts at other agencies. - Employment Division will provide specific information on occupations and industries involved. - Employment Division (Occupational Program Planning System and Labor Market Information System) will provide supply & demand data. - Employment Division (Systems Exploration and Research for Career Help) will provide detailed characteristics of occupations.	- local employers - Training Institutions - Use Surveys and Interviews built from basic data determined in B. Standard definitions (OES and SIC) & supply/demand data will provide specific detail for surveys & interview guides.	- Oregon Department of Education can provide requirements for approval. - Oregon Educational Coordinating Commission will provide conditions for new and long term program approval. - State Economic Development Commission will provide information on their restrictions or requirements. - Unions will provide specific information on restrictions to employment. - Licensing agencies will provide requirements for entering licensed occupations.
Questions to Ask	- Are there some emerging industries? - Are there new occupations? - Are there declining industries? - What types of training programs should be avoided?	- What specific occupations & industries are involved? - What is current employment & long term demand for specific industries? - What/Who are the major suppliers to the occupations?	- Who wants training? - What are the specific needs for training?	- Who controls what? - What are the steps and procedures for meeting requirements? - What timeframe is required for gaining approval of your agency?
Outputs or Products Needed	- Tentative list of specific industries that will be served. - List of occupations that cut across several local industries.	- List of occupations by OES Code - List of industries by SIC Code - Employment data - Projected trends	- Customer lists - Task inventory of industry needs - Task analyses of industry needs	- Agency contacts - Timeline for contacts - Procedures for making contacts - Copy of rules and regulations

Appendix A3

Appendix B

USE OF LIBRARY INFORMATION RETRIEVAL SERVICE

The LIRS system is a convenient and quick method for conducting background research on task-based curriculum. Many states have developed task inventory checklists for vocational programs during recent years. Example checklists can be obtained as follows:

1. Conduct a LIRS search using specific descriptors for task inventories in the training program under consideration.
2. Review the abstracts obtained through the LIRS search and select those abstracts that seem relevant to the training programs.
3. Review complete documents on microfiche to determine if task inventory checklists are appropriate to the training program being developed.
4. Have copies made of selected task inventory checklists from microfiche.

Microfiche for ERIC documents are available at the OSU library and in other centers in Oregon. Please check with the Oregon Occupational Information Network Coordinator to determine the most convenient source of ERIC microfiche.

Appendix B includes the following items:

B_1 LIBRARY INFORMATION RETRIEVAL SERVICE

This appendix item answers general questions about the Library Information Retrieval Service at Oregon State University.

B_2 INSTRUCTIONS FOR COMPLETING A LIRS REQUEST FORM AND THE REQUEST FORM

This item is a set of instructions for filling out a LIRS request form and the actual form for making the request.

B_3 LIRS DATA BASES

This appendix item lists the many data bases from which information may be searched. The prices for bibliographic references and abstracts are shown for each data base.

LIBRARY INFORMATION RETRIEVAL SERVICE

1. WHAT IS THE LIBRARY INFORMATION RETRIEVAL SERVICE?

LIRS, a division of the OSU Library, provides on-line bibliographic searching through remote access terminals. These terminals connect with information retailers like Lockheed Information Systems and Systems Development Corporation.

2. WHO USES LIRS?

OSU faculty, research staff, students, and people with courtesy appointments. Other academic requesters (non-OSU) utilize the service as do non-academic patrons.

3. WHAT DO I SEARCH?

LIRS directly retrieves information from a number of indexes and directories (i.e. Psychological Abstracts, Biological Abstracts, etc.) programmed for retrieval by computer. These data bases cover agriculture, the biological sciences, business, chemistry, education, engineering, the earch sciences, physics, psychology, and the social sciences.

4. WHAT ARE THE ADVANTAGES OF A COMPUTER SEARCH?

*specificity and comprehensiveness: through text-searching and Boolean logic, the searcher may specify search parameters by coordinating subjects, authors, time periods to be covered, etc.

*interaction: direct access to data bases allows the search to interact with the system to augment or alter the search strategy.

*immediate retrieval of information: a typical search make take from 10-20 minutes, as opposed to a number of days of equivalent manual searching.

5. WHAT DO I RECEIVE?

A computer-produced bibliography, not the original documents. Citations can be displayed in various formats on-line, or printed off-line at considerable savings. The latter reach you approximately one week after the search. Abstracts are only available in a few bases.

6. HOW CURRENT IS THE INFORMATION I RECEIVE?

This depends on the data base. Most cover only the last 4-5 years of the literature.

7. WHAT SERVICES DOES LIRS PROVIDE?

*Searches on Demand: search consultants will work with requesters to prepare a search on a particular topic. The search may be comprehensive or specific, and it may involve several data bases, depending on the nature of the request.

*Current Awareness: the LIRS staff can assist the requester in preparing a search profile which can be run each time the data base is updated. This assures the requester of a relevant and timely bibliography of materials in his/her field of interest.

8. HOW DO I INITIATE A SEARCH?

Obtain an LIRS information packet or search request form from the LIRS office, or one of the reference desks. Make an appointment with one of the search consultants by phoning 754-2249 or by completing the enclosed appointment card. Leave the card at the LIRS office (Rm 420) or at one of the reference desks, and a consultant will contact you.

9. HOW LONG WILL IT TAKE?

Generally an appointment may be made in 1 to 2 days. Appointments are scheduled for 1 hour, allowing enough time to discuss and prepare the strategy and run the search.

10. DO I NEED TO BE PRESENT?

It is often helpful to be present for the search to take advantage of the interactive nature of the data bases. A search can be run in absentia however.

11. HOW MUCH DOES IT COST?

Most searches run between $10-$30. Charges vary depending on the per minute charges for the data base ($0.13-$3.00), the time it takes to run the search (1 minute to over 20 minutes), and the number of citations printed (from less than 10 to more than 1000).

12. WHAT ARE THE BILLING RATES?

*OSU and OSSHE (Oregon State System of Higher Education) students and faculty are charged for actual search time (computer and communications charges) and for printing costs. Al other academic (private colleges, community college and public school systems, etc.) faculty and administrators are also direct costs.

*Non-academic patrons are charged a 15¢ surcharge on the direct costs and a $10/hr charge for strategy formulation and search time.

*Occasionally the Library will have money available to aid in funding a search. Ask the search consultant about the special funds.

13. HOW DO I PAY FOR A SEARCH?

If you use an account number, include it on the search request form. Your Department will receive a statement at the end of the month. LIRS uses all OSSHE account numbers.) Cash payments are handled by the Library Photocopy Room. Payment is made either when the search is run or the off-line prints arrive. If you need a copy of the bill, Photocopy can make a copy of the search request form for you.

Appendix B_2

INSTRUCTIONS FOR COMPLETING THE LIRS REQUEST FORM

1. Please list your name, department or organizational affiliation, position, and a phone number where you can be reached during the day.
2. We suggest that you discuss your topic with a reference librarian on the 2nd or 5th floor. The Librarian will be able to suggest other library resources and will be able to assist you in locating the references from your LIRS search. Please indicate if you have consulted with one of the librarians. If the librarian is interested in a report of the search results, have him/her sign the form.
3. Please describe your request in a narrative form, being as specific as possible. Use additional paper if necessary. Include a summary of your proposal if it is appropriate to the search.
4. Indicate the types of publications you would like to scan by checking the appropriate response(s).
5. Please indicate what languages you will consider. All of the titles will be translated into English, but our files are international in scope and cover publications in a number of languages.
6. Indicate the time coverage desired. Most of our data bases only cover material published since 1965-1970. We can limit coverage to very recent materials if desired, e.g. last 2-3 years.
7. List any relevant references or known authors, or bring copies of relevant papers with you for the search.
8. List all of the keywords or phrases which may be relevant to your search, including synonyms and variant spellings. These terms may be obtained from the titles of articles, the subject indexes or thesauri of pertinent abstracts, and from your own knowledge of the terminology of the topic.
9. Please indicate the latest date at which the results will be useful.
10. Return your completed form to the LIRS Office (Kerr Library, Rm 418), or call 754-2249 to make an appointment for a search. ALL SEARCHES ARE SCHEDULED BY APPOINTMENT. Forms may also be mailed to : LIRS, Kerr Library, Oregon State University, Corvallis, OR 97331.

SEARCH NO _____

William Jasper Kerr Library

Oregon State University

LIRS BIBLIOGRAPHIC SEARCH REQUEST FORM

NAME _____ PHONE: _____

DEPT/ORG: _____ POSITION: _____

IF YOU HAVE ANY QUESTIONS ABOUT LIRS OR THIS FORM, PLEASE REFER TO THE INSTRUCTIONS OR ASK FOR ASSISTANCE AT THE LIBRARY REFERENCE DESKS OR THE LIRS OFFICE (RM 418).

REFERENCE LIBRARIAN CONSULTED: ____ yes ____ no _____
Librarian's Signature

PROBLEM OR SEARCH TOPIC (Please write a brief description of your request):

_____

_____

_____

_____

TYPES OF PUBLICATIONS DESIRED: ____All ____Journal articles ____Technical reports
____Books ____Conference papers ____Dissertations ____Patents

LANGUAGES: ____English only ____All languages Languages in addition to English:

_____

TIME COVERAGE DESIRED: _____ thru _____

KNOWN AUTHORS/REFERENCES (Please include the author(s) name(s), year and volume of the publication, journal title and article title):

_____

_____

_____

_____

_____

KEYWORD/PHRASES (Please include synonyms or alternative ways of stating each concept):

KEYWORD/PHRASE:	KEYWORD/PHRASE:	KEYWORD/PHRASE:
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

RESULTS NOT NEEDED AFTER: _____

RETURN YOUR COMPLETED FORM TO THE LIRS OFFICE (RM 418, KERR LIBRARY) OR MAIL IT TO: LIRS, KERR LIBRARY, OREGON STATE UNIVERSITY, CORVALLIS, OREGON 97331

SEARCH NO_____

NAME/DEPT _____ SCHEDULED SEARCH DATE _____

SEARCH CONSULTANT _____

PURPOSE OF THE SEARCH: __Research project __Thesis __CLass project/paper

__Publication __Presentation Other (specify)_____

HOW DID YOU HEAR ABOUT LIRS: __Previous search __Professor __Colleague __Librarian

__Presentation __Brochure __Barometer Other (specify) _____

SEARCH PAYMENT WILL BE BY: __Cash/check __RC subsidy Univ account #_____

__Invoice BILL TO: _____

_____

_____

SEND RESULTS TO: __Library Photocopy Office (cash payments must be sent to Photocopy)

__Campus mail/shuttle bus __Hold for pickup, LIRS Office (must be charged or prepaid)

US MAIL, SEND TO: _____

_____

_____

RESULTS SENT: _____ CHARGES $_____

DATE BILLED: _____ _____

_____

****

DATA BASES:_____

SEARCH FORMULATION/COMMENTS:

AGRICULTURE, FORESTRY & HOME ECONOMICS

AGRICOLA (1970--)
U.S. Department of Agriculture
$0.41 minute*, $ 6.31 average**, $0.05 reference

CAB ABSTRACTS (1973--)
Commonwealth Agricultural Bureaux
$0.59 minute*, $12.75 average**, $0.125 reference, $0.25 abstract

FOOD SCIENCE & TECHNOLOGY ABSTRACTS (1967--)
$1.09 minute*, $13.25 average**, $0.075 reference, $0.15 abstract

FOODS ADLIBRA (1974--)
$0.92 minute*, * * * $0.05 reference, $0.10 abstract

FOREST PRODUCTS/AIDS (1947--)
$1.34 minute*, * * * $0.15 reference

PAPERCHEM (1968--)
Insitute for Paper Chemistry
$1.34 minute*, * * * $0.10 reference

PIRA ABSTRACTS (1975--)
Paper, Board & Packaging
$0.92 minute*, * * * $0.075 reference, $0.15 abstract

TITUS (1967--)
Textiles
$1.25 minute*, * * * $0.15 reference

WORLD TEXTILE ABSTRACTS (1970--)
$0.92 minute*, * * * $0.15 reference

APPLIED SCIENCE & TECHNOLOGY

APILIT (1964--)
American Petroleum Insitute
$1.42 minute*, * * * $0.20 reference

APTIC (1966--)
Air Pollution Technical Information Center
$0.59 minute*, $ 8.30 average**, $0.05 reference, $0.10 abstract

BHRA FLUID ENGINEERING (1974--)
$1.09 minute*, * * * $0.075 reference, $0.15 abstract

COMPENDEX (1970--)
Engineering Index
$1.09 minute*, $12.83 average**, $0.075 reference, $0.15 abstract

COLD REGIONS (1969--)
$1.09 minute*, * * * $0.15 reference

ENERGYLINE (1971--)
$1.50 minute*, $13.70 average**, $0.10 reference, $0.20 abstract

ENVIROLINE (1971--)
$1.50 minute*, $16.85 average**, $0.10 reference, $0.20 abstract

EPB (1973--)
Environmental Periodicals Bibliography
$1.00 minute*, $ 3.27 average**, $0.075 reference, $0.15 abstract

ISMEC (1973--)
Mechanical Engineering
$1.25 minute*, $ 5.16 average**, $0.15 reference

APPLIED SCIENCE & TECHNOLOGY cont.

METADEX (1966--)
Metals Abstracts
$1.34 minute*, $17.63 average**, $0.12 reference

POLLUTION (1970--)
$1.25 minute*, $ 8.93 average**, $0.15 reference

RAPRA (1972--)
Rubber & Plastics Research
$1.09 minute*, * * * $0.075 reference, $0.15 abstract

SAE ABSTRACTS (1965--)
Society of Automotive Engineers
$1.34 minute*, * * * $0.15 reference

TULSA (1965--)
Petroleum & fuel research
$2.09 minute*, * * * $0.50 reference

WATER RESOURCES ABSTRACTS/WRSIC
not directly available through LIRS

WELDASEARCH (1967--)
$1.09 minute*, * * * $0.075 reference, $0.15 abstract

WORLD ALUMINUM ABSTRACTS (1968--)
$).84 minute*, * * * $0.05 reference, $0.10 abstract

BIOLOGICAL & MEDICAL SCIENCES

BIOETHICSLINE (1973--)
$0.25 minute*, * * * $0.12 page

BIOSIS (1969--)
Biological Abstracts
$0.75 minute*, $15.00 average**, $0.01 reference

CANCERLINE (1967--)
$0.25 minute , * * * $0.12 page

EPILEPSYLINE (1945--)
$0.25 minute , * * * $0.12 page

EXERPTA MEDICA (1975--)
$0.92 minute*, $ 4.90 average**, $0.075 reference, $0.15 abstract

IPA (1970--)
International Pharmaceutical Abstracts
$0.84 minute*, $ 9.45 average**, $0.075 reference, $0.15 abstract

HEALTH
$0.25 minute , * * * $0.12 page

MEDLINE (1969--)
$0.25 minute , $ 2.56 average**, $0.12 page

PNI (1974--)
Pharmaceutical News Index
$1.50 minute*, * * * $0.15 reference

SCISEARCH (1974--)
Science Citation Index
$0.67 minute*, $ 7.40 average**, $0.10 reference

BIOLOGICAL & MEDICAL SCIENCES cont.

TOXLINE (1965--)
$0.25 minute*, $ 6.84 average**, $0.12 page

BUSINESS & ECONOMICS

ABI INFORM (1971--)
Associated Business Information
$1.25 minute*, $ 9.57 average**, $0.075 reference, $0.15 abstract

ACCOUNTANTS INDEX (1974--)
$1.34 minute*, * * * $0.10 reference

CANADIAN BUSINESS PERIODICALS INDEX
$1.25 minute*, * * * $0.10 reference

CHEMICAL INDUSTRY NOTES (1974--)
$1.00 minute*, * * * $0.20 reference

DISCLOSURE (1978--)
$1.50 minute*, * * * $0.25 reference, $3.00 record

ECONOMIC ABSTRACTS INTERNATIONAL (1974--)
$1.09 minute*, * * * $0.10 reference, $0.20 abstract

EIS INDUSTRIAL PLANTS (current)
$1.50 minute*, * * * $0.50 reference

EIS NONMANUFACTURING ESTABLISHMENTS (current)
$1.50 minute*, * * * $0.50 reference

FOREIGN TRADERS INDEX (current)
$0.75 minute*, * * * $0.25 reference

INSPEC (1969--)
$1.25 minute*, * * * $0.15 reference

MANAGEMENT (1974--)
$1.17 minute*, $ 8.90 average**, $0.075 reference, $0.15 abstract

PTS NEWS (1979--)
$1.59 minute*, * * * $0.11 reference

PTS FUNK & SCOTT INDEXES (1972--)
$1.50 minute*, * * * $0.25 reference, $0.50 abstract

PTS PROMPT (1972--)
$1.50 minute*, * * * $0.25 reference, $0.50 abstract

EARTH SCIENCES

GEOARCHIVE (1969--)
$1.17 minute*, * * * $0.10 reference, $0.20 abstract

GEOREF (1967--)
American Geological Institute
$1.25 minute*, $19.50 average**, $0.20 reference

EDUCATION & BEHAVIORAL SCIENCES

CHILD ABUSE & NEGLECT (1965--)
$0.59 minute*, * * * $0.05 reference, $0.10 abstract

ERIC (1966--)
Educational Resources Information Clearinghouse
$0.59 minute*, $ 8.58 average**, $0.05 reference, $0.10 abstract

EDUCATION & BEHAVIORAL SCIENCES cont.

EXCEPTIONAL CHILD EDUCATIONAL RESOURCES (1966--)
$0.42 minute*, * * * $0.05 reference, $0.10 abstract

LANGUAGE & LANGUAGE BEHAVIOR ABSTRACTS (1973--)
$0.92 minute*, $ 6.08 average**, $0.075 reference, $0.15 abstract

NICEM (1964--)
Educational media
$1.17 minute*, * * * $0.10 reference, $0.20 abstract

NICEM/MIMIS (1974--)
Educational media for the handicapped
$0.59 minute*, * * * $0.05 reference, $0.10 abstract

PSYCHOLOGICAL ABSTRACTS (1967--)
$1.09 minute*, $ 8.44 average**, $0.05 reference, $0.10 abstract

SOCIOLOGICAL ABSTRACTS (1963--)
$0.92 minute*, $ 7.58 average**, $0.075 reference, $0.15 abstract

OCEANOGRAPHY & MARINE BIOLOGY

AQUACULTURE (1970--)
$0.59 minute*, * * * $0.075 reference, $0.15 abstract

AQUATIC SCIENCES & FISHERIES ABSTRACTS (1978--)
$0.59 minute*, * * * $0.10 reference

MRIS ABSTRACTS (1970--)
Maritime Research Information Service
$0.75 minute*, * * * $0.05 reference, $0.10 abstract

OCEANIC ABSTRACTS (1964--)
$1.25 minute*, $13.53 average**, $0.10 reference, $0.15 abstract

PATENTS

APIPAT (1964--)
American Petroleum Institute
$1.42 minute*, * * * $0.075 reference, $0.15 abstract

CLAIMS (1950--)
$1.59 minute*, * * * $0.10 reference

PHYSICAL SCIENCES

CHEMICAL ABSTRACTS (1970--)
$1.50 minute*, $ 9.47 average**, $0.05 reference, $0.10 abstract

INSPEC (1969--)
Physics Abstracts and Computer & Control Abstracts
$0.92 minute*, $ 9.47 average**, $0.05 reference, $0.10 abstract

RTECS (1976--)
$0.25 minute , * * * $0.02 reference, $0.05 abstract

SPIN (1975--)
American Institute of Physics
$0.59 minute*, * * * $0.05 reference, $0.10 abstract

SURFACE COATINGS ABSTRACTS (1976--)
Paint Research Association
$1.09 minute*, * * * $0.15 reference

RESEARCH & DEVELOPMENT

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (FAPERS)
not directly available through LIRS

COMPREHENSIVE DISSERTATION ABSTRACTS (1861--)
$0.92 minute*, $ 6.96 average**, $0.12 reference

CONFERENCE PAPERS INDEX (1973--)
$1.25 minute*, * * * $0.15 reference

CRIS (current)
U.S. Department of Agriculture's Current Research Information Service
$0.67 minute*, $ 5.14 average**, $0.05 reference, $0.10 abstract

ENCYCLOPEDIA OF ASSOCIATIONS (current)
$0.92 minute*, * * * $0.15 record

FOUNDATION DIRECTORY (current)
$1.00 minute*, * * * $0.30 record

FOUNDATION GRANTS INDEX (current)
$1.00 minute*, * * * $0.30 record

FROST & SULLIVAN DM2 (1975--)
$1.50 minute*, * * * $0.15 reference

GRANTS (current)
$1.00 minute*, $22.63 average**, $0.35 reference

NTIS (1964--)
National Technical Information Service
$0.59 minute*, $ 8.84 average**, $0.05 reference, $0.10 abstract

SSIE (current)
Smithsonian Science Information Exchange
$1.50 minute*, $13.17 average**, $0.109 reference, $0.20 abstract

U.S. CONTRACT AWARDS (current)
$1.50 minute , * * * $0.15 reference

SOCIAL SCIENCES & HUMANITIES

AMERICA HISTORY & LIFE (1955--)
$1.09 minute*, $ 3.01 average**, $0.075 reference, $0.15 abstract

ART BIBLIOGRAPHIES MODERN (1974--)
$1.00 minute*, * * * $0.075 reference, $0.15 abstract

CANADIAN NEWSPAPER INDEX (1977--)
$1.25 minute*, * * * $0.10 reference

CONGRESSIONAL INFORMATION SERVICE (1970--)
$1.50 minute*, * * * * $0.25 abstract

CONGRESSIONAL RECORD (1976--)
$1.34 minute*, * * * $0.15 reference

FEDERAL REGISTER (1976--)
$1.34 minute*, * * * $0.20 reference

GPO MONTHLY CATALOG (July 1976--)
Government Printing Office
$0.59 minute*, * * * $0.10 reference

HISTORICAL ABSTRACTS (1973--)
$1.09 minute*, $ 4.68 average**, $0.075 reference, $0.15 abstract

LIBRARY & INFORMATION SCIENCE ABSTRACTS (1964--)
$0.84 minute*, * * * $0.15 reference

SOCIAL SCIENCES & HUMANITIES cont.

MAGAZINE INDEX (1977--)
$0.75 minute*, $ 6.51 average**, $0.10 reference

MLA BIBLIOGRAPHY (1976--)
Modern Language Association
$0.92 minute*, * * * $0.075 reference, $0.15 abstract

NATIONAL NEWSPAPER INDEX (1979--)
$1.25 minute*, * * * $0.10 reference

PAIS INTERNATIONAL (1972--)
Public Affairs Information Service
$1.00 minute*, * * * $0.075 reference, $0.15 abstract

PHILOSOPHERS INDEX (1940--)
$0.92 minute*, * * * $0.075 reference, $0.15 abstract

RILM (1972--)
Repertoire International de Litterature Musicale
$1.09 minute*, * * * $0.075 reference, $0.15 abstract

SOCIAL SCISEARCH (1972--)
Social Science Citation Index
$1.17 minute*, $ 7.40 average**, $0.05 reference, $0.10 record

USPSD (1975--)
United States Political Science Documents
$1.09 minute*, * * * $0.075 reference, $0.15 abstract

STATISTICS

AMERICAN STATISTICS INDEX (1973--)
$1.50 minute*, * * * * $0.25 abstract

PTS INTERNATIONAL ANNUAL TIME SERIES (1972--)
$1.50 minute*, * * * $0.25 reference, $0.50 record

PTS INTERNATIONAL STATISTICAL ABSTRACTS (1971--)
$1.50 minute*, * * * $0.25 reference, $0.50 record

PTS U.S. ANNUAL TIME SERIES (1971--)
$1.50 minute*, * * * $0.25 reference, $0.50 record

PTS U.S. REGIONAL TIME SERIES (1971--)
$1.50 minute*, * * * $0.25 reference, $0.50 record

PTS U.S. STATISTICAL ABSTRACTS (1971--)
$1.50 minute*, * * * $0.25 reference, $0.50 record

* does not include communications charge which vary from 9¢ to 36¢, depending upon which communications system and computer terminal is used.

** average computer and communications charge for 1979, does not include printing charges.

*** average charge not available.

Appendix C_1

ORAL INTERVIEW GUIDE

1. What job titles (electronics) are represented in your firm? (Give OES Code list to employer and: a)ask them to check off occupations they have, b) add others not included on list, c) given their local titles for ones checked.)

2. How many employees in your firm require previous specialized training in electronics?

3. Which of these job titles require specialized training in electronics for job entry?

4. Which positions require training for job advancement and/or retention in employment?

5. Where do most of your employees (electronics) receive their training?

High School ____	Industry Training School ____
Community College ____	On-The-Job Training ____
University ____	Military ____
Technical Trade School ____	Other, specify _____
Within Oregon _____	Outside Oregon _____

6. What specific technical skills seem to be missing in the people that come to work for your firm?

7. What related skills and knowledges are most necessary for successful employment in your firm?

Read ____	Speak ____	Other _____
Write ____	Listen ____	
Analyze ____	Compute ____	

8. What personal traits are most important for successful employment with your firm?

Tenaciousness ____
Responsibility for Others ____
Human Relations ____
Other, please specify _____

9. Do you have a formal training program within your firm for updating and upgrading employee skills? If so, please describe:

10. If _____ Community College were to develop programs for preparation and or updating training, would your firm utilize them? If yes

a. What types of preparation and/or update training is your firm interested in?

Technical Skills _____
Other, specify _____

b. What training format would be preferred:

Seminars (less than 1 day) ____
Workshops (1 - 5 days) ____
Short Courses (1 - 3 weeks) ____
College Term Courses ____
Short-Term Training Program (up to one year) ____
Intensive Training Program (Two Years) ____

c. What time of day is more appropriate?

Saturday ___ Winter ____ Other, specify:
Evenings ___ Spring ____
Summer ____
Fall ____

d. Where should training be conducted?

Community College Campus ____
At Firm ___
Other location, please specify: _____

11. What are the major products of your firm?

12. Does your "crystal ball" foresee new and emerging technologies in electronics that should be included in an electronics curriculum?

13. Will this result in new jobs being created? If yes, define the new jobs

14. Would you be interested in providing further assistance toward development of an industry based curriculum in electronics for community colleges in Oregon? If yes, specify:

Advisory group to verify skills to include in curriculum. ___
Assist with task analyses by mail. ____
Allow employees to respond to task inventory. ___
Provide an observation or work experience site. ___
Other, specify: _____

_____

Appendix C_2

MAIL SURVEY POSTCARD

RESPONSE FORM

1. How many employees in your firm require previous specialized training in electronics?

2. What job titles (electronics) are represented in your firm? Specify:

3. What level of technical training in electronics is required for job entry into your firm?

   a. High School ____ Community College ____
      University ____ Technical Trade ____

   b. Is experience required?
      If yes, specify amount: _____

4. What types of electronics training can be developed by your local community college to better meet the needs of your firm?

   Updating ____ Retraining ____ Upgrading ____
   Preparation for Job Entry ____ Other ____,
   Specify: _____

"THANK YOU FOR YOUR HELP"

Appendix D_1

Steps in Sample Identification

1. Contact OOICC and request assistance in identifying a valid representative sample of industries and occupations that are being considered in the development of instructional programs. Call 378-8146.
2. OOICC will either recommend a sampling plan or refer you to specific contacts in the Employment Division. Be prepared to discuss sample in terms of DOT, OES, or SIC codes for occupations and industries. The Dictionary of Occupational Titles (DOT) and Standard Industrial Codes (SIC) are available in community college libraries. The Oregon Employment Statistics Dictionary (OES) is available from the Employment Division. Call or write Research and Statistics, Employment Division, 875 Union Street N.E., Salem, Oregon 97311 (Telephone 378-8650) for OES information. An example of sample classification is found in Appendix D_2.
3. Based on staff availability, identify sample size to be interviewed on-site or through mail survey.
4. OOICC may help to identify actual sample or will identify sample groupings and numbers of firms to be contacted from each OES or SIC class. Select 30% alternates when identifying sample.
5. The Directory of Oregon Manufacturers (available in most libraries) has names, addresses, number of employees and contact persons for technical industries in Oregon. For non-technical areas, planners may need to resort to yellow pages for other information sources to specifically identify sample.

6. Develop a listing of firms to be interviewed and/or surveyed by mail. The listing should include firm name, address, contact person and telephone numbers.
7. Call firm; explain need for their cooperation; verify that they do employ persons in designated classes; arrange for management interviews; and verify location and contact persons for firm.
8. Revise sampling plan based on responses from industry as to their willingness to cooperate with survey.

Appendix D_2

INDUSTRY SAMPLE

Dictionary of Occupational Title Classification

DOT No.	DOT Name
003.151.010	Sales Engineer, Electrical Products
003.151.014	Sales Engineer, Electronic Products and Systems
003.161.010	Electrical Technician
003.161.014	Electronics Technician
003.161.018	Semi-Conductor - Development Technician
003.261.010	Instrumentation Technician
003.281.010	Electrical Drafter
719.261.010	Biomedical Equipment Technician
720.281.010	Radio Repairer
720.281.014	Tape Recorder Repairer
720.281.018	Television and Radio Repairer
721.261.014	Final Tester (Electrical Equipment)
722.281.010	Instrument Repairer (Telephone and Telegraph Co.)
722.381.014	Instrument Inspector (Aircraft-Aerospace Mfg.)
724.281.010	Transformer Tester (Light, Heat, Power)
726.261.010	Electronics Assembler, Developmental
726.281.014	Electronics Tester I
726.361.010	Electronics Utility Worker
726.381.010	Electronics Inspector I
726.684.022	Electronics Inspector II
726.684.026	Electronics Tester II
729.281.010	Audio-Video Repairer
729.281.026	Electrical Instrument Repairer
729.281.030	Electromedical Equipment Operator
729.281.034	Inside-Meter Tester
729.281.046	X-Ray Equipment Tester

Oregon Employment Statistics Classification

Sample Code	OES No.	OES Name
1	21005	Electrical/Electronic Engineers
2	32004	Electrical/Electronic Technicians
3	51024	Electrical Equipment Repairman
4	51055	T. V. Service Repairer
5	55C99	Shop Repairer Instruments
6	51077	Electronic Mechanic
7	51023	Electric Instrument Repairer
8	55V13	Electro/Mech Assembly, A
9	55V14	Electro/Elect Assembly, A
10	55U43	Elec/Mech Assembly, B
11	55V44	Elec/Elect Assembly, B

Standard Industrial Classification

Sample Code	SIC No.	SIC Name
1	3570	Office, Computing and Accounting Machines
2	3660	Communication Equipment
3	3670	Electronic Components and Accessories
4	3820	Measuring and Controlling Instruments
5	4810	Telephone Communication (Wire and Radio)
6	4910	Electric Services
7	5060	Electrical Goods
8	5080	Machinery, Equipment and Supplies
9	5730	Radio, Television and Music Stores
10	7620	Electrical Repair Shops
11	9100	Executive, Legislative and General Government

Appendix E

Daily Schedule

Oral Interviews of Industry

		Telephone
9:00 a.m.	Radio Shack Division of Tandy Corporation 2775 River Road Eugene, Oregon 97404	689-0311
11:00 a.m.	Lane Electric, Inc. 1715 Franklin Blvd. Eugene, Oregon 97403	484-1151
1:00 p.m.	Fletcher and Smart Service Co. 1351 Willamette Street Eugene, Oregon 97401	343-8873
2:30 p.m.	Vitus Electric Supply Co. 2358 W. 7th Place Eugene, Oregon 97402	484-6337
4:00 p.m.	Spectra-Physics 959 Terry Street Eugene, Oregon 97402	683-5700

Alternate:

	Silke Communications 680 Tyler Street Eugene, Oregon 97402	687-1611

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
A. Use Basic Theories of Electronics		
1. DC		
a. Basic insulator		
b. Basic conductor		
c. Atomic & Electron Theories		
d. OHM's law		
e. Watt's law		
f. Series circuits		
g. Parallel circuits		
h. Series - Parallel circuits		
i. Voltage divider		
j. Current divider		
k. Kirshoff's law		
l. Network analysis		
m. Current flow		
n. Resistance		
o. Thevenins Theorem		
p. Nortons Theorem		
q.		
r.		
2. AC		
a. Magnetism		
b. Basic transformer		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
A. Use Basic Theories of Electronics (continued)		
c. Basic capacitor		
d. Basic inductors		
e. Relays		
f. Resonance		
g. Impedance		
h. Sine Wave generation		
i. Filter circuit		
j. Band pass		
k. Band stop		
l. Time constants		
m.		
n.		
3. Electrical Devices		
a. Diodes, Power and Signal		
b. Zener Diodes		
c. Diacs		
d. Triacs		
e. Silicon Controlled Rectifiers		
f. Transisters		
(1) Unijuction		
(2) Bi-Polar		
(3) Field-Effect		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
A. Use Basic Theories of Electronics (continued)		
g. Thermocouples		
h. Control devices		
i. Transducers		
j. Vacuum tubes		
(1) Diodes, Triodes, Pentodes, Tetrodes		
(2) CRT's		
(3) Klystrons		
(4) TWT's		
(5) BWO		
(6) Thyratron		
k.		
l.		
4. Electronic Circuits		
a. Circuit coupling		
b. Classes of power amplifiers		
c. Amplifier		
d. Tuned band amplifier		
e. Broad band amplifier		
f. Vacuum tube oscillator		
g. Solid state oscillator		
h. IF Amplifiers		
i. RF Amplifiers		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
A. Use Basic Theories of Electronics (continued)		
j. Audio Amplifiers		
k. Power Amplifiers		
l. Amplifier neutralization		
m. Wave shaping		
n. Voltage regulation		
o. Current regulation		
p.		
q.		
5. Digital		
a. Logic circuit		
b. Multivibrator		
c. Clamper and limiter		
d. Timing networks		
e. IC flip-flops		
f. Microprocessors		
g. RAM (Random Access Memory)		
h. Boolean algebra		
i. LSIC (Large Scale Integrated Circuit)		
j. IC OP amps		
k. Comparators		
l. Integrated circuits		
m. FET, Mos FET, CMOS		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
A. Use Basic Theories of Electronics (continued)		
n. ROM (Read Only Memory)		
o. Counters		
p. Shift Registers		
q. Modems and Teletypes		
r. Arithmetic circuits		
s. Computer Interfaces		
t. LED Displays		
u.		
v.		
6. Radio		
a. AM/FM		
b. Microwave theory		
c. Frequency measurement		
d. Transmission line theory		
e. Propagation of electromagnetic wave		
f. Antennas		
g.		
h.		
B. Identify Electronic Components		
1. Resistors by color code		
2. Caps		
3. Various inductors		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
B. Identify Electronic Components (continued)		
4. Various transducers		
5. IC Chips		
6. Various semi-conductors		
7. Various connecting hardware		
8. Transistor Types		
9. Diode Types		
10. Vacuum Tube Types		
11. Switches		
12.		
13.		
C. Identify Through Application of Basic Theory		
1. Voltage sources		
2. Ground potentials		
3. Series circuits		
4. Parallel circuits		
5. DC generators		
6. AC generators		
7. P-P voltage (peak to peak voltage)		
8. RMS voltage (Root-Mean-Square voltage)		
9. Types of transformers		
10. Types of capacitors		
11. PWR supply rectification methods		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
C. Identify Through Application of Basic Theory (continued)		
12. Uses of PWR Supply rectification		
13. Solid state devices		
14. d.b. (deci-Bell)		
15. And, Nand, NOR, OR, Flip-Flops, Registers		
16. Character generation		
17. TTY, TTS, ASC-II Coding (teletype)		
18. Band rates		
19. Digital Signaling-EIA, Conversion, etc.		
20. Audio frequencies		
21. Audio levels		
22. Radio frequencies		
23.		
24.		
D. Measure and Test		
1. Potential difference in circuit		
2. Current flows		
3. Rise and fall times		
4. V, I, R and Z (Voltage, Current, Resistance & Impedance		
5. L and C (Inductance and Capatance)		
6. Frequency		
7. Time Durations		
8. Power		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
D. Measure and Test (continued)		
9. Resistance		
10. VSWR (Voltage Standing Wave Ratio)		
11. Pulse widths		
12. Period		
13. TTL Logic States (Transistor-Transistor Logic States)		
14. Distortion		
15. Deviation		
16. Diodes		
17. Transistors		
18. Vacuum Tubes		
19. Modulation		
20.		
21.		
E. Calculate		
1. Circuit losses		
2. Inductance and/or capitance		
3. Xc and Xl (Capactive Reactance & Inductive Reactance)		
4. Z of trans and delay lines (Impedance of ----)		
5. Component values for tuned circuit		
6. Gain of amplifier		
7. Effect of feedback loop components		
8. Antenna field strength		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
E. Calculate (continued		
9. Modulation percentage		
10. Bias networks		
11. Add, subtract, multiply and divide		
12. Common factions		
13. Powers of ten		
14. Linear equations		
15. Quadratic equations		
16. Exponents and radicals		
17. Logarithms		
18. Octal Numbering System		
19. Hexadecimal Numbering System		
20. Binary Numbering System		
21. Total Circuit Resistance		
22.		
23.		
F. Use and Care for Equipment		
1. Power converter		
2. Energy storage cells		
3. Piezoelectric devices		
4. VOM-VTVM		
5. Oscope		
6. SWR meter		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
F. Use and Care for Equipment (continued)		
7. Pulse generator		
8. Signal generator		
9. Curve tracer		
10. Regulated power supply		
11. Soldering equipment		
12. Ohmmeter		
13. Ammeter		
14. Coil Winding Machine		
15. Hand tools		
16. Audio generator		
17. Multimeter		
18. Digital Counter		
19. Communications Service Monitor		
20. Spectrum Analyzer		
21. Frequency Counter		
22. Power meter/Bolometer		
23. Crystal Detector		
24. Alternators, Fixed and Step		
25. Logic Probe		
26. Current Probe		
27. Distortion Analyzer		
28. Differential Amplifier		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
F. Use and Care for Equipment (continued)		
29. Specialized System - Test Sets (Digital)		
30. Service Monitor		
31.		
32.		
G. Perform Skills and Processes that Involve		
1. Integrated Circuits		
2. Pulse and logic circuits		
3. Micro-electronic components and packaging		
4. Electronic component specifications		
5. Wire splices		
6. Wire size selection		
7. Color codes		
8. P. C. Boards		
9. Bias networks		
10. Feedback loop components		
11. Test equipment calibration		
12. Mechanical fasteners		
13. Signal flow determination		
14. In-circuit frequencies		
15. Wire harness		
16. Electronic component replacement		
17. Electronic equipment installation		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
G. Perform Skills and Processes that Involve (continued)		
18. Digital circuits		
19. Microprocessors		
20. Solder Techniques		
21. Basic Hand Tools		
22. Mechanical Control Devices		
23. Sub-assembly level (remove and replace)		
24.		
25.		
H. Perform Related Tasks		
1. Complete job sheet and service reports		
2. Read specifications and understand them		
3. Read schematics		
4. Prepare new specifications		
5. Make oral and written reports		
6. Use calculator		
7. Draw schematics		
8. Magnetic and Digital Control Design		
9. Keep logs and records		
10. Maintain Documentation		
11. Follow-up on problem areas		
12. Order parts and supplies		
13. Modify equipment		

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. ADD ANY TASKS WHICH MAY BE MISSING FROM THIS INVENTORY. BLANK SPACES ARE PROVIDED FOR WRITE-INS.	CHECK	COMMENTS
H. Perform Related Tasks (continued)		
14. Draft budget		
15. Assign work		
16. Procure equipment		
17. Act as technical advisor		
18. Research new systems and techniques		
19.		
20.		
I. Demonstrate Personal Qualities		
1. Use safety standards set by industry (local levels)		
2. Practice personal cleanliness and appearance		
3. Follow orders and verbal instructions		
4. Cooperate with fellow workers and company employers		
5. Get to work on time		
6. Customer relations		
7. Complete paper work on time		
8. Oral communications with customers		
9. Work without direct supervision		
10.		
11.		

Appendix G

COMPUTER ANALYSIS OF
TASK INVENTORY

1. Call OSU Computer Center (754-3474) for an appointment with a computer consultant.
2. Number completed task inventories by coding for OES Number and SIC Number.

   Example: See Appendix D_2 for understanding the origin of the sampling coding. For instance, respondent #36 (John Doe) works as an OES #2 (Electronic Technician) for SIC Industry #9 (Radio, TV and Music Stores. The coding for this man's task inventory is:

Respondent #	OES #	SIC GROUP	
36	9	9	or 36-2-9

3. Meet with computer consultant or arrange to send in task inventories by mail.
4. Explain that a tally of each task is desired. The tally must be by:
   a) SIC Code
   b) OES Code
   c) Total Sample
5. Have task inventory results placed on punch cards in the key punch room at OSU Computer Center. Keypunching costs 20¢ per card.
6. Computer consultant will enter cards on computer and check results for validity of data.

7. Pick up or have computer printouts mailed to your school.
8. Review tally results, eliminating those tasks of low numerical value.
9. Design matrices for summarizing computer printouts by changing format of task inventory checklist to:

OES OCCUPATIONS

Task	E/E Engineer	E/E Technician	Electro-Mechanical Technician	Radio & T.V. Repair	E/E Assembly		Composite	Value Index
1. Use Theory of DC	X	X	X	X	X		X	67
2. Use Theory of AC	X	X	X	X	X		X	65
3. Use Theory of Electrical Devices	X	X	X	X	X		X	43

and:

SIC INDUSTRIES

Task	Office, Computing & Accounting	Communication Equipment	Electronic Components	Measuring & Controlling Instrument	Telephone Communication	Radio, Television & Music Stores	Composite	Value Index
1. Use Theory of Electrical Circuits	X		X	X			X	38
2. Use Theory of Radio		X	X					18

10. Summarize computer printouts by SIC industries and OES code. This will identify specific skills used in different industry groupings. This information can be useful in designing instructional programs for industry.

11. Summarize results of total sample by listing numbers of responses for each task. This allows the reader to gauge how much the task cuts across industries and occupations. This summary can be made on a blank task inventory.

12. Screen out tasks of doubtful value by making comparisons of summary matrices.

13. Community colleges with their own computer capability may wish to use the following Fortran program for tally and summary of task inventories:

```
PROGRAM PRINTR      73/172  OPT=1                                FTN 4.8+518

  1                 PROGRAM PRINTR(TAPE4,TAPE5,TAPE6,TAPE7)
                    DIMENSION JTAB(283,11),KTAB(283,11),IA(283),LABEL(283)
                    INTEGER SUM
                    DO 2 I=1,283
  5                 DO 2 J=1,11
                    JTAB(I,J)=0
                    KTAB(I,J)=0
                2   CONTINUE
                    WRITE(6,200)
 10                 WRITE(7,200)
                200 FORMAT(1HS)
                201 FORMAT(1H1,*TASK  OES *,11I4,*  SUM*/1H )
                203 FORMAT(1H1,*TASK  SIC *,11I4,*  SUM*/1H )
                202 FORMAT(1H ,R4,6X,11I4,I5)
 15                 READ(4,100)LABEL
                100 FORMAT(20R4)
                5   READ (5,101)ID,IJ,IK,IA
                101 FORMAT(3I2,X,66I1/7X,66I1/7X,66I1/7X,66I1/7X,19I1)
                    IF(EOF(5))99,10
 20             10  DO 20 I=1,283
                    IF (IJ.GT.0)
                   1  JTAB(I,IJ)=JTAB(I,IJ)+IA(I)
                    IF (IK.GT.0)
                   1  KTAB(I,IK)=KTAB(I,IK)+IA(I)
 25             20  CONTINUE
                    GO TO 5
                99  DO 50 I=1,283
                    IF(I-1-(I-1)/60*60.GT.0)GO TO 45
                    WRITE(6,201)(J,J=1,11)
 30                 WRITE(7,203)(J,J=1,11)
                45  CONTINUE
                    SUM=0
                    DO 46 J=1,11
                46  SUM=SUM+JTAB(I,J)
 35                 WRITE(6,202)LABEL(I),(JTAB(I,J),J=1,11),SUM
                    SUM=0
                    DO 47 J=1,11
                47  SUM=SUM+KTAB(I,J)
                    WRITE(7,202)LABEL(I),(KTAB(I,J),J=1,11),SUM
 40             50  CONTINUE
                    STOP
                    END
```

TASK ANALYSIS CHECKLIST
(Sample Only)

Appendix H

LISTED BELOW ARE THE DUTIES AND TASKS THAT ARE COMMONLY PERFORMED IN THE FIELD OF ELECTRONICS. PLEASE CHECK THOSE TASKS THAT ARE NEEDED BY THE EMPLOYEES OF YOUR FIRM. COLUMNS ARE PROVIDED FOR IDENTIFYING WHETHER THE SKILL IS REQUIRED FOR ENTRY LEVEL OR CAN BE LEARNED ON THE JOB; LEVEL OF DIFFICULTY; AND FREQUENCY OF ITS USE IN YOUR FIRM.	Entry Level		Level of Difficulty			Frequency		
	Entry	On The Job	Easy	Moderate	Difficult	Small Amount	Average Amount	Great Amount
A. Use Basic Theories of Electronics								
1. DC								
a. Basic insulator	x		x			x		
b. Basic conductor	x		x			x		
c. Atomic & Electron Theories	x			x		x		
d. OHM's law	x			x			x	
e. Watt's law	x			x				
f. Series circuits	x			x				x
g. Parallel circuits	x			x				x
h. Series - Parallel circuits	x			x				x
i. Voltage divider	x			x				x
j. Current divider	x			x				x
k. Kirchhoff's Law	x			x				x
l. Network analysis	x			x				x
m. Current flow	x			x				x
n. Resistance	x			x				x
o. Thevenins Theorem	x			x			x	
p. Nortons Theorem	x			x			x	
q.								
r.								
2. AC								
a. Magnetism	x		x			x		
b. Basic transformer	x			x			x	

APPENDIX I

COVER LETTER TO TASK ANALYIS RESPONDENTS

Dear _____:

As consultants for a Clatsop Community College project for training/ retraining of electronics industry employees, we conducted oral interviews at your firm and solicited your assistance in doing a task inventory. The task inventory returns have been tallied and analyzed by computer.

The last step in an occupational analysis is the task analysis. The task analysis defines whether the student should have a skill upon entry into employment or whether the skill is to be learned on-the-job. Also the level of difficulty (easy, moderate, difficult) and frequency of performance (small amount, average amount, great amount) must be defined for each task.

Since the results of this task analyses will become the basis for an electronics curriculum and the college seeks to have an industry based curriculum, your assistance with the task analyses is most important in determining content and emphasis in electronics training.

Will you please assist us by checking the appropriate columns on the task analyses worksheet? As with the task inventory, we prefer to have one technician and one supervisor of technicians respond to the task analysis. A self-addressed stamped envelope is provided for returning the completed task analysis.

We very much appreciate your cooperation with the interview and the task inventory process. Hopefully, this cooperation will eventually bring returns back to your industry.

Sincerely,

Burr Fancher and Associates
Project Consultants

Appendix J

COMPUTER ANALYSIS
TASK ANALYSES

1. Call OSU Computer Center (754-3474) for appointment with computer consultant.
2. Code task analyses (completed) in upper right hand corner. Codes shall reflect OES and SIC numbers.

   Example: See Appendix D_2 for understanding the origin of the sample coding. For instance, respondent #36 (John Doe) works as an OES #2 (Electronic Technician) for SIC Industry #9 (Radio, TV and Music Stores). The coding for this man's task inventory is:

Respondent #	OES #	SIC GROUP	
36	2	9	or 36-2-9

3. Meet with computer consultant or arrange to send in task analyses by mail.
4. Explain that a tally of responses is desired for entry level, level of difficulty and frequency of use of each task on the task analysis sheets. The tally must be by:
   a) SIC Code
   b) OES Code
   c) Total Sample
5. Have task analyses results key punched. The Computer Center will key punch for 20¢ per card.
6. Computer consultant will enter cards into the computer.
7. Pick up computer printouts or have them mailed to your school.
8. Review printout, eliminating those of weak numerical value.

9. Use blank task analyses forms for summarizing data. A composite task analyses should be averaged from the tally. A task analyses may be developed for each SIC industry or OES Occupation if needed.

	ENTRY LEVEL		LEVEL OF DIFFICULTY			FREQUENCY OF USE		
Task	Entry	OJT	Easy	Moderate	Difficult	Seldom	Average	Often
1. Use Theory of AC	(63)	12	8	(62)	5	1	2	(72)
2. Use Theory of DC	(65)	10	7	(60)	8	2	9	(64)

10. Summarize totals by listing tally numbers in each category and accepting the majority response. The two tasks above would be entry level, moderately difficult and often used.

11. Summaries by OES code and SIC code can be accomplished in the same manner as the total summary by transcribing the tally results from the computer printout to the task analyses sheet.

DEFINING THE INSTRUCTIONAL FORMAT

INSTRUCTIONS:
From the completed task analyses, arrange tasks into an order that allows a building block effect for skills development. Group tasks together to fit into logical instruction. List sequences of tasks into format below. Check competency levels as identified by industry on the task analyses. Check the delivery unit or time required to achieve the designated competency level.

INSTRUCTIONAL CATEGORIES AND TASKS	COMPETENCY LEVEL DESIRED BY INDUSTRY			OPTIMUM DELIVERY UNITS AND TIME REQUIREMENTS FOR SKILL DEVELOPMENT						COMMENTS
	Understanding of the Concept	Perform With Supervision	Perform Without Supervision	College Term Classes (12 Weeks)	Short Term Training Program (Up to 1 Year)	Intensive Training Program (2 Years)	Short Courses (1 - 3 Weeks)	Workshops (1-5 Days)	Seminars (Less Than 1 Day)	Limitations, Special Equipment Needed, Etc.
A DC THEORY										
1. Basic Insulator										
2. Basic Conductor										
3.										
4.										

EXAMPLE OF DELIVERY SYSTEM SPECIFICATIONS

MAJOR INSTRUCTIONAL SEQUENCES i.e. AC, DC, Digital	Instructional Delivery Units i.e. Seminar, Workshop, College Term Class	Time Required i.e. 3 Days, 2 Hours	Number of Staff Required and Names of Staff That Will Deliver Instruction	Instructional Site i.e. community college, industry site	Methods of Instruction		Special Features of Delivery i.e. coop work experience, apprenticeship
					Theory %	Practice %	
TOTALS	X			X			

APPENDIX L

APPENDIX M

TRAINING PROPOSAL

Utilizing delivery system specifications (Appendix L), write a training proposal for use with industry.

Content: Describe content areas and competency levels expected of program completers.

Format: Describe how the content will be delivered including sequencing of instruction, delivery units and methods of delivery.

Conditions: Describe when and where training can be delivered.

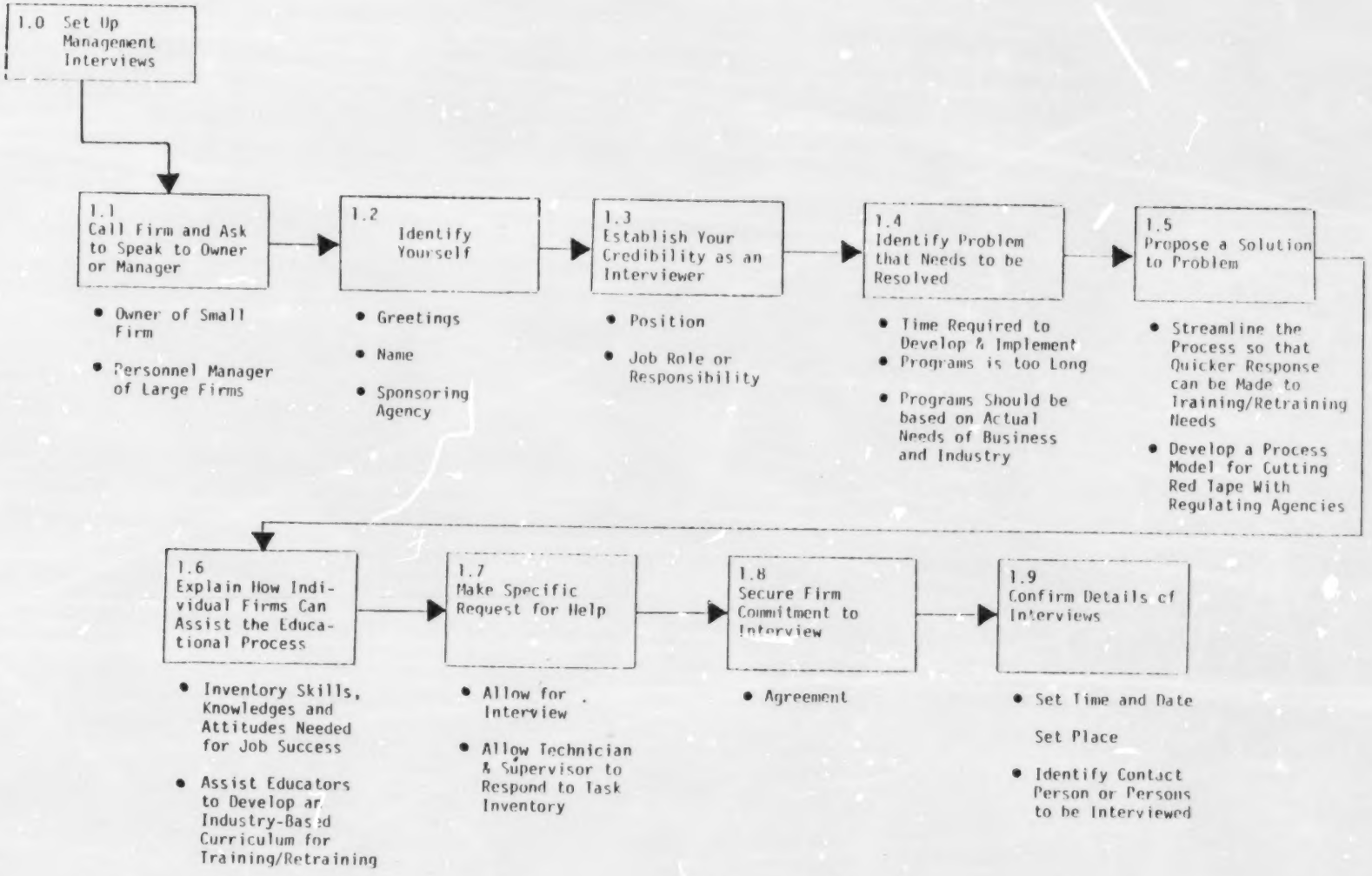
Staffing Requirements: Identify number of staff needed for delivery of instruction and identify individuals that will provide instruction.

A USER'S GUIDE

TO EDUCATIONAL MARKETING

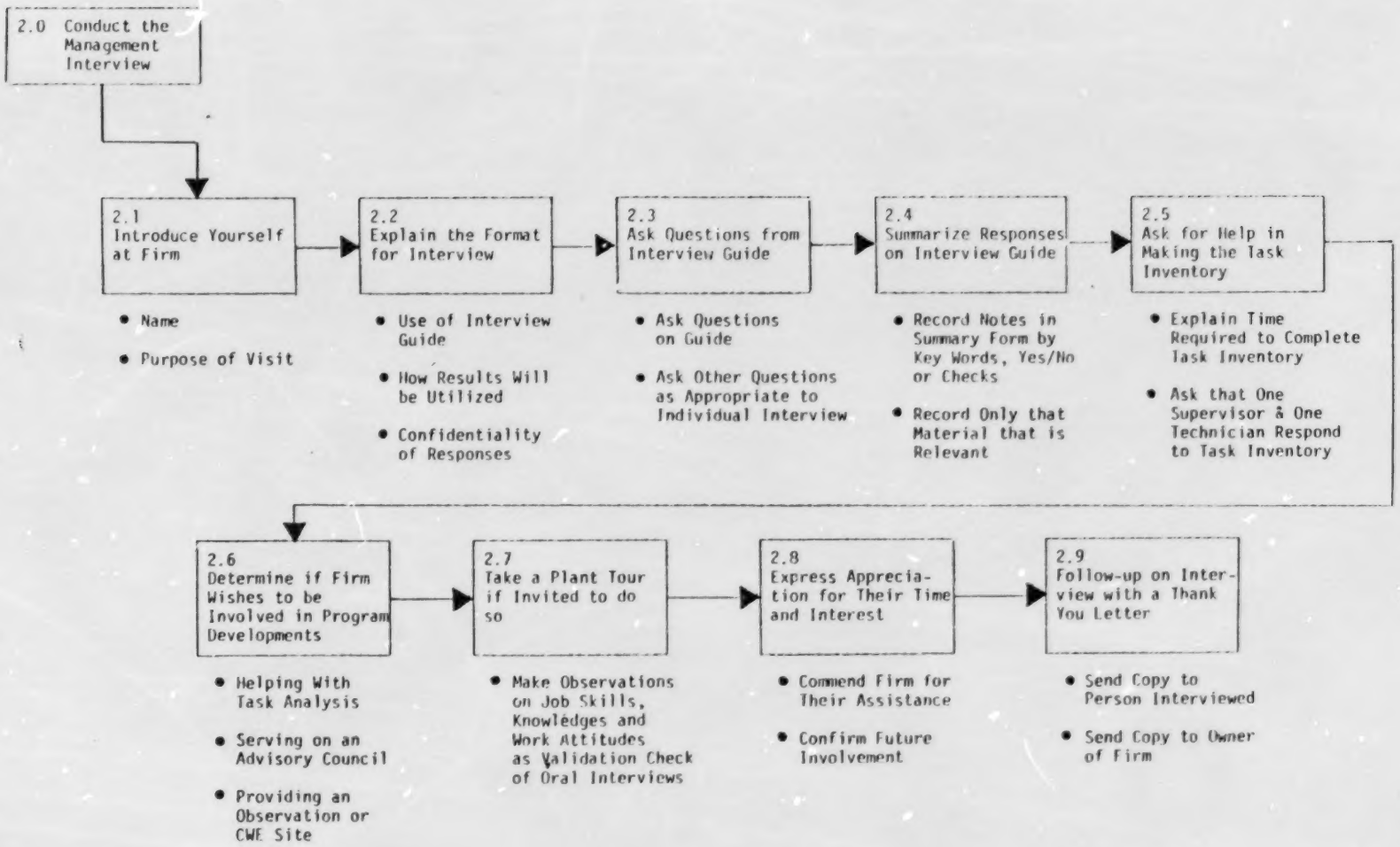
(See ED 206 364)

PROCESS FOR SETTING UP MANAGEMENT INTERVIEWS


1.0 Set Up Management Interviews
1.1 Call Firm and Ask to Speak to Owner or Manager
• Owner of Small Firm
• Personnel Manager of Large Firms
1.2 Identify Yourself
• Greetings
• Name
• Sponsoring Agency
1.3 Establish Your Credibility as an Interviewer
• Position
• Job Role or Responsibility
1.4 Identify Problem that Needs to be Resolved
• Time Required to Develop & Implement Programs is too Long
• Programs Should be based on Actual Needs of Business and Industry
1.5 Propose a Solution to Problem
• Streamline the Process so that Quicker Response can be Made to Training/Retraining Needs
• Develop a Process Model for Cutting Red Tape With Regulating Agencies
1.6 Explain How Individual Firms Can Assist the Educational Process
• Inventory Skills, Knowledges and Attitudes Needed for Job Success
• Assist Educators to Develop an Industry-Based Curriculum for Training/Retraining
1.7 Make Specific Request for Help
• Allow for Interview
• Allow Technician & Supervisor to Respond to Task Inventory
1.8 Secure Firm Commitment to Interview
• Agreement
1.9 Confirm Details of Interviews
• Set Time and Date
Set Place
• Identify Contact Person or Persons to be Interviewed

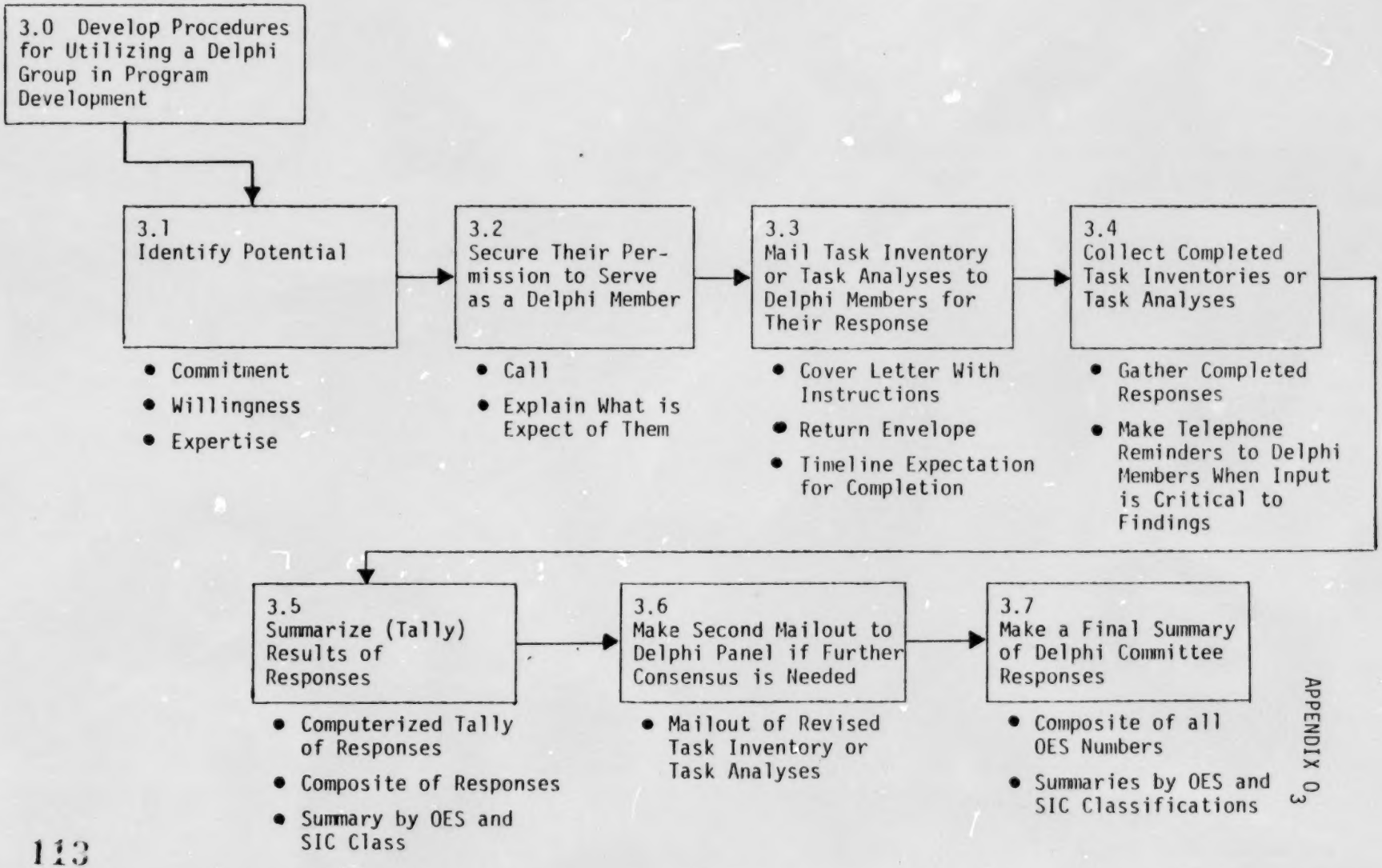
APPENDIX O1

PROCESS FOR CONDUCTING MANAGEMENT INTERVIEWS


2.0 Conduct the Management Interview
2.1 Introduce Yourself at Firm
• Name
• Purpose of Visit
2.2 Explain the Format for Interview
• Use of Interview Guide
• How Results Will be Utilized
• Confidentiality of Responses
2.3 Ask Questions from Interview Guide
• Ask Questions on Guide
• Ask Other Questions as Appropriate to Individual Interview
2.4 Summarize Responses on Interview Guide
• Record Notes in Summary Form by Key Words, Yes/No or Checks
• Record Only that Material that is Relevant
2.5 Ask for Help in Making the Task Inventory
• Explain Time Required to Complete Task Inventory
• Ask that One Supervisor & One Technician Respond to Task Inventory
2.6 Determine if Firm Wishes to be Involved in Program Developments
• Helping With Task Analysis
• Serving on an Advisory Council
• Providing an Observation or CWE Site
2.7 Take a Plant Tour if Invited to do so
• Make Observations on Job Skills, Knowledges and Work Attitudes as Validation Check of Oral Interviews
2.8 Express Appreciation for Their Time and Interest
• Commend Firm for Their Assistance
• Confirm Future Involvement
2.9 Follow-up on Interview with a Thank You Letter
• Send Copy to Person Interviewed
• Send Copy to Owner of Firm

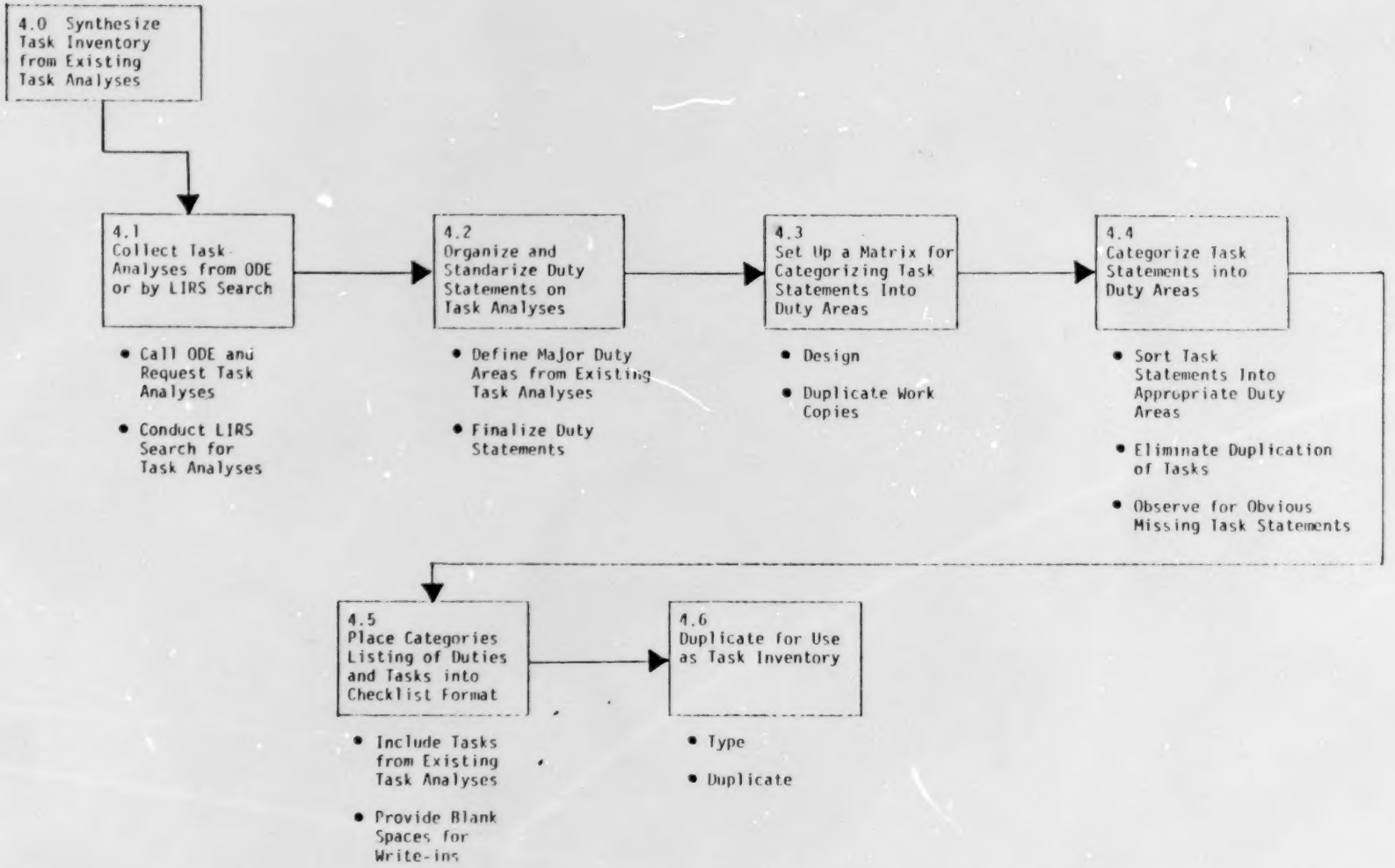
APPENDIX O_2

DEVELOP PROCEDURES FOR UTILIZING A DELPHI GROUP


3.0 Develop Procedures for Utilizing a Delphi Group in Program Development
3.1 Identify Potential
• Commitment
• Willingness
• Expertise
3.2 Secure Their Permission to Serve as a Delphi Member
• Call
• Explain What is Expect of Them
3.3 Mail Task Inventory or Task Analyses to Delphi Members for Their Response
• Cover Letter With Instructions
• Return Envelope
• Timeline Expectation for Completion
3.4 Collect Completed Task Inventories or Task Analyses
• Gather Completed Responses
• Make Telephone Reminders to Delphi Members When Input is Critical to Findings
3.5 Summarize (Tally) Results of Responses
• Computerized Tally of Responses
• Composite of Responses
• Summary by OES and SIC Class
3.6 Make Second Mailout to Delphi Panel if Further Consensus is Needed
• Mailout of Revised Task Inventory or Task Analyses
3.7 Make a Final Summary of Delphi Committee Responses
• Composite of all OES Numbers
• Summaries by OES and SIC Classifications

APPENDIX O_3

SYNTHESIZING TASK INVENTORY FROM EXISTING TASK ANALYSES


4.0 Synthesize Task Inventory from Existing Task Analyses
4.1 Collect Task Analyses from ODE or by LIRS Search
• Call ODE and Request Task Analyses
• Conduct LIRS Search for Task Analyses
4.2 Organize and Standarize Duty Statements on Task Analyses
• Define Major Duty Areas from Existing Task Analyses
• Finalize Duty Statements
4.3 Set Up a Matrix for Categorizing Task Statements Into Duty Areas
• Design
• Duplicate Work Copies
4.4 Categorize Task Statements into Duty Areas
• Sort Task Statements Into Appropriate Duty Areas
• Eliminate Duplication of Tasks
• Observe for Obvious Missing Task Statements
4.5 Place Categories Listing of Duties and Tasks into Checklist Format
• Include Tasks from Existing Task Analyses
• Provide Blank Spaces for Write-ins
4.6 Duplicate for Use as Task Inventory
• Type
• Duplicate

MATRIX FOR SUMMARIZING MANGEMENT INTERVIEWS

ame, Address, ontact, Telephone	SAMPLE NO.	SIC #	OES	DOT	(2) Number Employed Requiring Previous Training	(3) Job Titles Requiring Training for Job Enry	(4) Positions Requiring Training for Advancement or Retention	(5) Where Employees Received Training	(6) Technical Skill Deficiency	(7) Related Skills Needed	(8) Personal Traits Needed	(9) Formal Training Program	(10) Training Needs				(11) End Products of Firm	(12) New and Emerging Technologies	(13) New Jobs That Will be Created
													Type	Format	Optimum Time	Training Site			

TRANSPARENCY MASTERS

STEPS	MODEL
1	BACKGROUND RESEARCH
2	AGENCY COORDINATION
3	OCCUPATIONAL ANALYSIS
4	DESIGN INSTRUCTIONAL PROGRAM
5	MARKET THE INSTRUCTIONAL PROGRAM

STEP ONE

CONDUCT BACKGROUND RESEARCH

- WITHIN OREGON
  - ODE
  - OOICC
  - OTHERS
- OUTSIDE OREGON
  - LIRS
  - OTHER

STEP TWO

IDENTIFY INVOLVEMENT

- IDENTIFY AGENCIES
- DEFINE COORDINATION LINKAGES
- PLAN AGENCY INVOLVEMENT

STEP THREE

CONDUCT AN OCCUPATIONAL ANALYSIS

- MANAGEMENT INTERVIEWS
- TASK INVENTORY
- TASK ANALYSIS

STEP FOUR

CONDUCT AN INSTRUCTIONAL ANALYSIS

- DEFINE INSTRUCTIONAL FORMAT
- SPECIFY DELIVERY SYSTEMS
- DEVELOP TRAINING PROPOSAL

STEP FIVE

MARKET THE INSTRUCTIONAL PROGRAM

- IDENTIFY AND CONTACT CUSTOMERS
- COMPLETE AGREEMENTS AND CONTRACTS WITH CUSTOMERS
- DELIVER INSTRUCTIONAL PROGRAM
- FOLLOW-UP WITH CUSTOMER